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Williams®



HIGH IMPACT™

F O O T B A L L

KIT



**HIGH IMPACT FOOTBALL KIT
INSTALLATION & OPERATIONS
MANUAL**

- * Game Operation & Adjustments
- * Game Testing & Problem Diagnosis
- * Parts Information
- * Reference Diagrams & Schematics

WILLIAMS ELECTRONICS GAMES, INC.
3401 N. CALIFORNIA AVE.
CHICAGO, IL 60618

HIGH IMPACT FOOTBALL!

Experience the earnings impact of Williams' HIGH IMPACT FOOTBALL, and discover why sports video will never be the same again! Only HIGH IMPACT breaks new ground with LIVE ACTION football that delivers all the bone-crunching tackles, circus catches and high energy gridiron excitement.

HIGH IMPACT brings football to life with the energy and strategy of a non-stop highlight film. The reason is Williams' own exclusive digitized graphics technology for on-screen football action that's so real players will feel like suiting up!

With 15 Pro-Action teams to choose from, HIGH IMPACT packs scoring power and continuous buy-in profit punch for 1 to 4 players. There's easy-to-use single "Move" joystick and "Action" button *Superstar™* Controls, with over 40 authentic Offensive plays and Defensive formations to choose from.

This is the single football game you've been waiting for! Players will test their skills to master long-range Bombs, Double Reverses, Half-back Options, Nickel Defense, Zone Coverage, Stunts, Red-Dog Blitz and so much more.

HIGH IMPACT brings you all the action on and off the field - the cheerleaders, the coaches, the outrageous banter of Manic Max™ the deranged play-by-play commentator, the hot dog antics of the players and the cheers and jeers of the fans led by Joe Six-Pack™.

Game Rules:

1 Player on a team: You are Quarterback and Defensive Captain.

2 Players on a team: Players 2 & 3 are Quarterbacks.
 Players 1 & 4 are Defensive Captains.

START/BUYIN: Insert coin(s) and hit START button for each coin.

OFFENSE

PASS: Point Joystick to receiver, hit Action button.

Handoff: Point Joystick to halfback, hit Action button.

Spin Move: Hit Action button & move Joystick up or down.

Jump Move: Hit Action button & move Joystick right or left.

Kick: Tap Action button rapidly to increase distance.

DEFENSE

Select Player To Control: Hit Action button before hike.

Turbo Speed: Hold down Action button for Awesome Speed Burst.

Killer Tackle: Hit Action button.

Interception: Hit Action button for leaping catch.

Block Kick: Hit Action button.

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NOTES:

HIGH IMPACT FOOTBALL KIT

S E C T I O N one

Installation, Operation
& Troubleshooting

Safety Notices

The following safety hints apply to all kit operators and service personnel. Specific warnings and cautions will be found throughout this manual where they apply. We recommend that you read this page, and also all of Section 1, before preparing your kit for play.

NOTICE: SALVAGED PARTS

Parts salvaged from old games are required to complete your kit. These salvaged parts must operate perfectly; otherwise, the converted game cannot perform properly or safely. Always repair circuit board malfunctions and cabinet damage before conversion is attempted.

NOTICE: POWER SUPPLY

Be sure the power supply from your old game is capable of +5V dc at 5A, -5V dc at 1A and +12V at 1A. These operating voltages are necessary for your kit. Your power supply must be FCC approved.

NOTICE: MONITOR

This kit is not intended for use with X-Y monitors. Suitable monitors have horizontally mounted CRTs and raster electronics with inputs for red, green and blue video, as well as composite Negative sync input.

NOTICE: COIN MECHANISM

Be sure to clean and lubricate your old coin mechanisms. Servicing them is crucial to your game's earning potential and operation.

NOTICE: COIN METERS

Coin meters are not provided with this kit. Wiring information is provided as a convenience to the operator.

NOTICE: SERVICING, INSTALLING

Always turn your game OFF and unplug it before attempting to service or install your kit.

CAUTION

PROPERLY ATTACH ALL CONNECTORS. Be sure that the connectors on each printed circuit board (PCB) are properly connected. If they do not slip on easily, do not force them. A reversed connector may damage your kit and void the warranty. All connectors are keyed to fit specific pins on each board.

Conversion Procedure

Inspection

Unpack the materials from the carton and inspect for obvious signs of damage. Use this checklist to be sure your kit is complete.

Part No.	Item	Quantity
() A-8550-1	Pot & Bracket Assembly	1
() C-13234-40004	CPU Y-unit	1
() C-9214-1	Button Assy-Blue	2
() C-9214-4	Button Assy Red	2
() C-9214-5	Button Assy-White	4
() A-13971-40004	Audio Board Assy	1
() H-12758	Audio Board Jumper Cable	1
() H-13257	Sound Pwr/ Spker Cable	1
() H-13724	Player 3 & 4 Cable	1
() H-8865	Volumn Control Cable 18"	1
() H-8866	Volumn Control Cable Assy	1
() 03-8250	Control Panel Cover	1
() 16-40104-101	Manual	1
() 16-9192	Template Control Panel	1
() 16-9192-1	Template Control Panel P2	1
() 16-9192-2	Template Control Panel P3	1
() 16-9192-3	Template Control Panel P4	1
() 20-9222	Palnut 5/8	8
() 20-9319-1	8-way Joystick- Red	2
() 20-9319-9	8-way Joystick- Blue	2
() 20-9457	Button Holder w/Switch	8
() 31-1612-40104	Control Panel Overlay	1
() 31-1613-40104	Marquee	1
() 31-1616-40104	Decal Cabinet Side	1
() 31-1617-40104	Decal Control Panel	1
() 4308-01123-20B	Cairage Bolt 8-32x1-1/4	16
() 5795-10937-18	Ribbon Cable	1
() Assorted Hardware		

Recommended Tools and Supplies

- () black semi-gloss paint
- () electric drill
- () electric screwdriver
- () grease pencil or marker
- () hex driver
- () 180 grit sandpaper or electric sander
- () pliers
- () razor knife
- () soldering iron and solder
- () wire cutters
- () black electrical tape
- () quick-hardening wood putty

Cabinet Modifications

1. Fill in gouges with a good quick-hardening wood putty. Sand cabinet and wipe it clean.
2. Repaint the cabinet with black semi-gloss paint (Games wood grain sides: remove the old decals and clean the glue residue from the old decal before painting). Allow paint to dry completely.
3. Pencil a line roughly at the top of the old graphic. Lightly moisten the cabinet with soapy water. Apply the decal starting at the top and working down. After the decal is in place, use a squeegee and smooth the decal down, taking care to squeeze out the air bubbles. If you miss an air bubble, pop it with a razor blade or a pin and burnish it down. Allow 12 hours for the adhesive in the decals to set. Remove masking.
4. Check the HIGH IMPACT FOOTBALL Kit for an FCC sticker and apply it over the existing sticker on the cabinet.

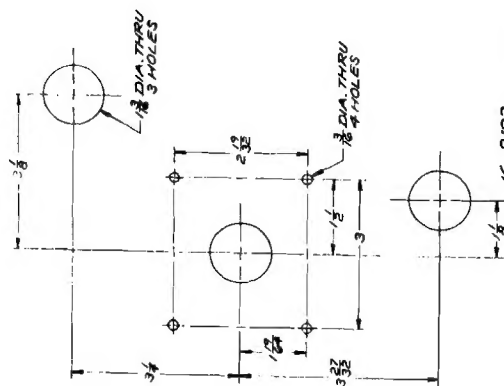
When Williams Electronics ships a game, it is in compliance with FCC regulations. The FCC sticker is proof. If the sticker is missing or damaged, legal repercussions to the owner or distributor of the game may result. If your game kit does not contain an FCC sticker, call Williams Electronics immediately.

5. Apply the Instructions (Card or Decals) to the CRT viewing glass.

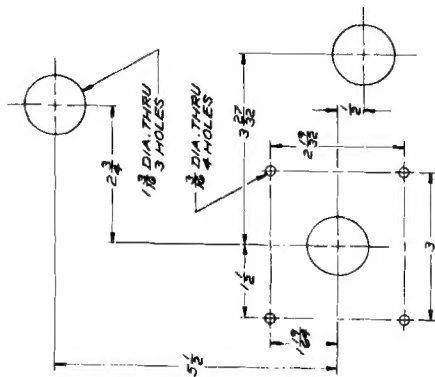
Control Panel Modifications

1. Remove the control panel buttons and joysticks and remove the old vinyl covering.
2. Place the template on the control panel and use it to help you design your control panel. You will need to use the Mounting Template for each player you intend to install.
3. Drill holes as needed for the joysticks and buttons. Plug previous holes with wood blocks, putty, cardboard or epoxy. File the new holes smooth.
4. Carefully remove the backing on the vinyl control panel overlay. Place the overlay on top of the control panel. Prevent air bubbles from getting under the vinyl overlay.

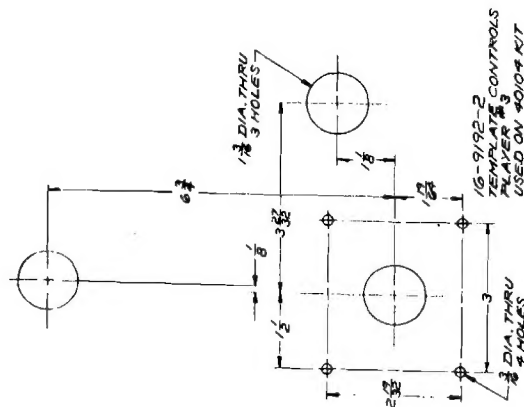
4 - PLAYER CONVERSION KIT



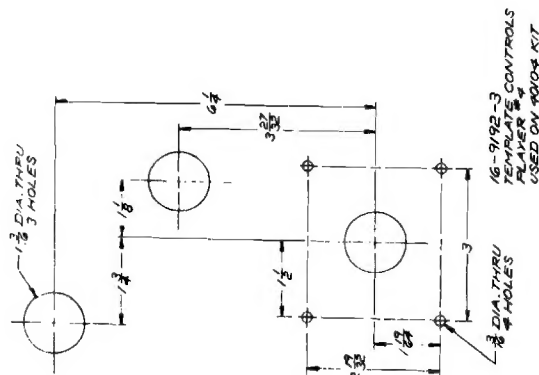
16-9192
TEMPLATE CONTROLS
PLAYER 1
USED ON 40104 KIT



16-9192-1
TEMPLATE CONTROLS
PLAYER 2
USED ON 40104 KIT

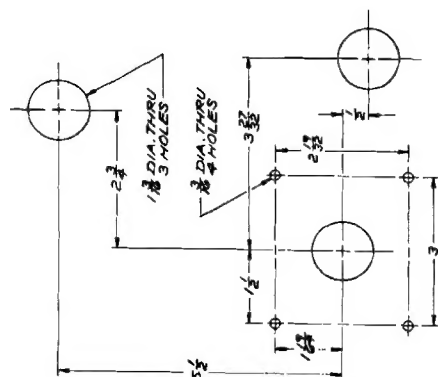


16-9192-2
TEMPLATE CONTROLS
PLAYER 3
USED ON 40104 KIT

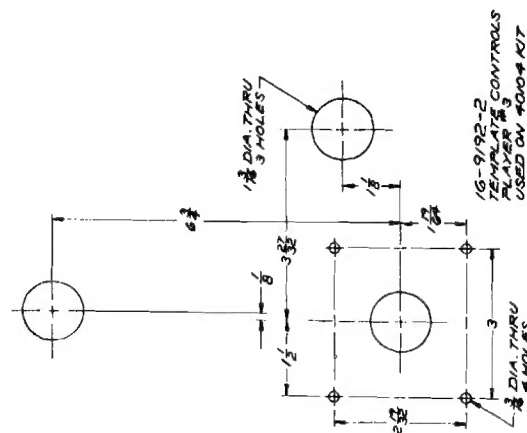


16-9192-3
TEMPLATE CONTROLS
PLAYER 4
USED ON 40104 KIT

2 - PLAYER CONVERSION KIT



16-9192-1
TEMPLATE CONTROLS
PLAYER 1
USED ON 40104 KIT



16-9192-2
TEMPLATE CONTROLS
PLAYER 2
USED ON 40104 KIT

5. a) After the overlay is on securely , use a razor knife to cut holes for the buttons and joysticks.
b) Position the stickers around the appropriate button locations. Refer to the Typical Control Panel Layout diagrams on the next pages for suggested button and joystick locations.
c) Peel the backing from the adhesive on the clear protective overlay. Position the overlay so that it covers the stickers and press it into place. Use a razor knife to cut holes for the joystick and buttons.
6. To mount the pushbuttons and button-holder/switch to the control panel, push the threaded end of the pushbutton through the control panel from the top so that the threads extend through the back of the control panel. Then, take the white plastic button holder/switch and place it over the pushbutton threads so that the threads extend through the hole in the holder. The blade switch must point toward the back of the cabinet and face you. Secure into place with a pinnut. Repeat for all of the pushbutton switches.
7. To mount the joystick assembly to the control panel first position the switch assembly so that the square base is against the back of the control panel and the hole in the base lines up with the joystick hole in the control panel. Secure the switch assembly to the control panel. Be sure that the blade switch with the red wire (move up) faces the monitor when the control panel is closed. Remove the "E"-ring , white plastic spacer and spring from the joystick shaft. Slip the black plastic washer around the joystick shaft so the rough side faces the handle. Push the shaft through the joystick base from the front of the control panel. After the shaft is through the base, replace the spring, spacer and "E"-ring.

Installing the PC Boards and Wiring into a JAMMA Game Cabinet

Caution

Properly insulate any unused wires within the JAMMA Cable.

1. Disconnect and remove the existing video board in the JAMMA Game Cabinet.
2. Mount the HIGH IMPACT FOOTBALL KIT video board inside the JAMMA Game Cabinet where the old video board was located
3. If you choose to use the JAMMA Cable provided with the kit, unsolder your old JAMMA cable from the speaker, power supply, control panel switches (which may already be disconnected) and coin door. Remove the cable from the game. If you are not going to use the JAMMA Cable provided with the kit, check the JAMMA Cable Connector Chart to be sure your cable is compatible. Leave your power supply chassis as is.
4. Connect the JAMMA Cable to J1 on the HIGH IMPACT FOOTBALL KIT video board. Using the JAMMA Cable Connector Chart for reference, solder the correct JAMMA Cable wires to the speaker, power supply, control panel switches and coin door. Plug the player 1 & 2 JAMMA connectors into their joystick cable connectors.
5.
 - a) For a (4) player conversion, wire the player 3/4 cable from players 3 & 4 control panel joysticks & buttons to connectors 3P & 4P on the CPU Board.
 - b) For a (2) player conversion, ignore above (a) and procede.
6. Connect the player 3 & 4 joystick harness from the CPU board to the joysticks. The 3rd player connector has red wires and is connected from J4 on the CPU board to the player 3 joystick. The 4th player connector has blue wires and is connected from J12 on the CPU board to the player 4 joystick.
7. J6, J7, and J9 on the CPU board are not used.
8. Place the FBI Warning Label on the inside of the cabinet next to the PC boards. Be sure the label is completely visible.

Installing the PC Boards and Wiring into a NON-JAMMA Game Cabinet

NOTE: IF YOU NEED A JAMMA MAIN HARNESS PLEASE CONTACT YOUR AUTHORIZED WILLIAMS' DISTRIBUTOR. (JAMMA MAIN HARNESS PART # H-13411)

1. Disconnect and remove the existing video board in the JAMMA Game Cabinet.
2. Mount the HIGH IMPACT FOOTBALL KIT video board inside the JAMMA Game Cabinet where the old video board was located. Mount the sound board next to the CPU board using the stand-offs and screws provided.
3. Leaving several inches of wire, cut the wires at the coin door, control panel switches (which may already be disconnected) speaker and power supply.
4. Connect the JAMMA Cable to J1 on the HIGH IMPACT FOOTBALL KIT video board. Follow the JAMMA Cable Connector Chart and splice the wires of the JAMMA Cable to the existing wires for the coin door, power supply, speaker and control panel. Be sure all of the spliced wires are well insulated with black electrical tape.
5.
 - a) For a (4) player conversion, wire the player 3/4 cable from players 3 & 4 control panel joysticks & buttons to connectors 3P & 4P on the CPU Board.
 - b) For a (2) player conversion, ignore above (a) and proceed.
6. Connect the player 3 & 4 joystick harness from the CPU board to the joysticks. The 3rd player connector has red wires and is connected from J4 on the CPU board to the player 3 joystick. The 4th player connector has blue wires and is connected from J12 on the CPU board to the player 4 joystick.
7. J6, J7, and J9 on the CPU board are not used.
8. Place the FBI Warning Label on the inside of the cabinet next to the PC boards. Be sure the label is completely visible.

Note

The Ribbon Cable may need to be twisted in order to connect it properly.

Note

Be sure all spliced wires are well insulated with black electrical tape.

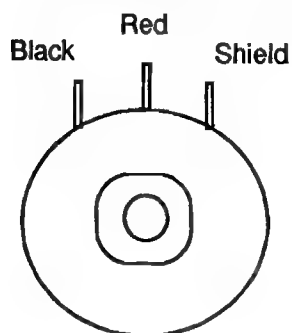
Caution

Properly insulate any unused wires within the JAMMA Cable.

Installing the Volume Control

1. Mount the volume control, using screws provided, where it is easily accessible. On top of the cash box, or on the wall near sound board are two possible locations.
2. The volume control cable attaches the volume control to the sound board at connector J2. When viewed with the white plastic knob facing you, the shield wire should be soldered to the right lug, the red wire should be soldered to the middle lug, and the black wire should be soldered to the left lug. Refer to Volume Control Diagram.

Volume Control Wiring Diagram



Game Features

Starting Up

Switch on power to the game. A "rug" pattern appears on the crt screen. When the "rug" pattern ends, the screen shows CHECKING SCRATCH RAMS, and then CHECKING ROMS. The next screen shows HIGH IMPACT FOOTBALL REVISION LEVEL, CMOS TEST OK and the COIN SETTING. The game then moves to the attract mode. After the proper coinage has been inserted, the game exits the attract mode and enters the play mode.

**HIGH IMPACT FOOTBALL KIT IS
A 1 TO 4 PLAYER GAME.**

NOTE

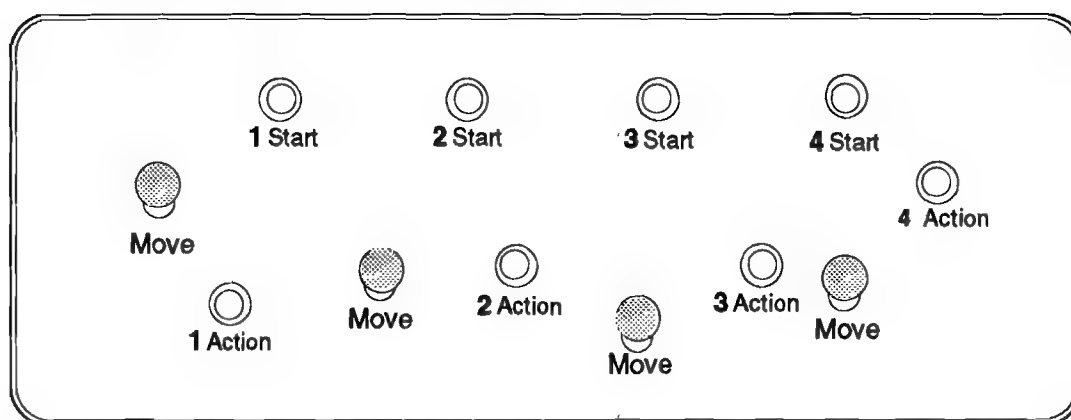
HIGH IMPACT FOOTBALL will operate in the Test Mode, when the Test Switch (on the cash box cover) is closed or DIP Switch Bank #2 Switch #8 is closed.

When an error is detected during Start-up Tests, game start-up does not progress, and an error message appears on the screen.

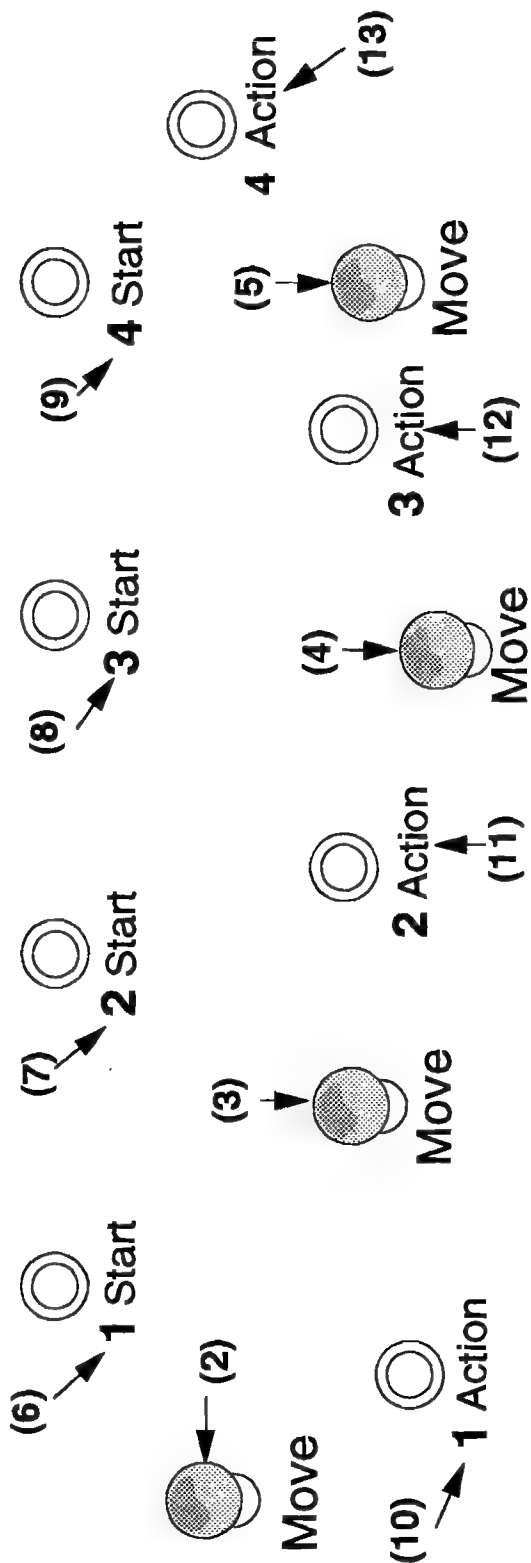
Player Controls

- Each Start button allows (1 to 4) players to begin play or continue play.
- 1 Action button per player.
- 1 Joystick (Move) per player.
- See following page for detailed control panel conversions (2 & 4 player), and a template layout for (2 & 4 player) control panel decal suggestions.

4 Player HIGH IMPACT FOOTBALL Control Panel

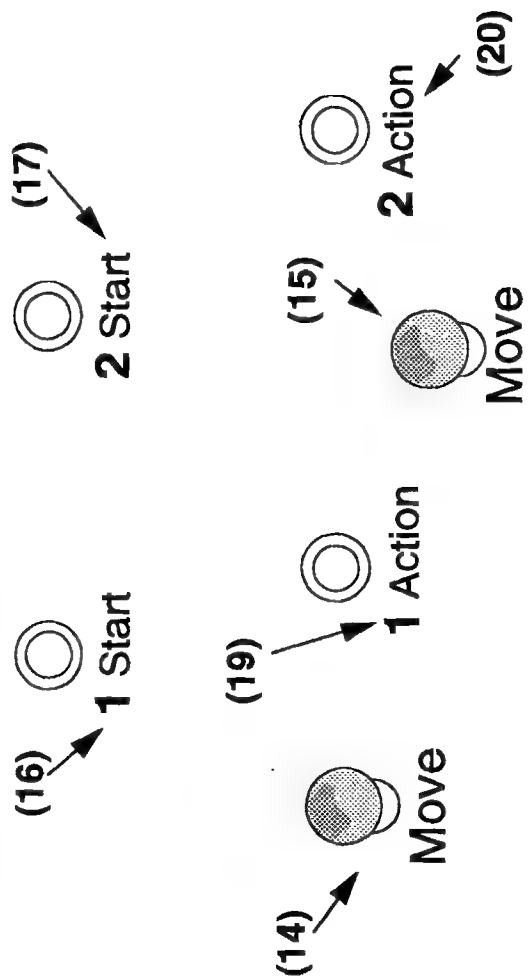


Match (#) with decal number on previous page.

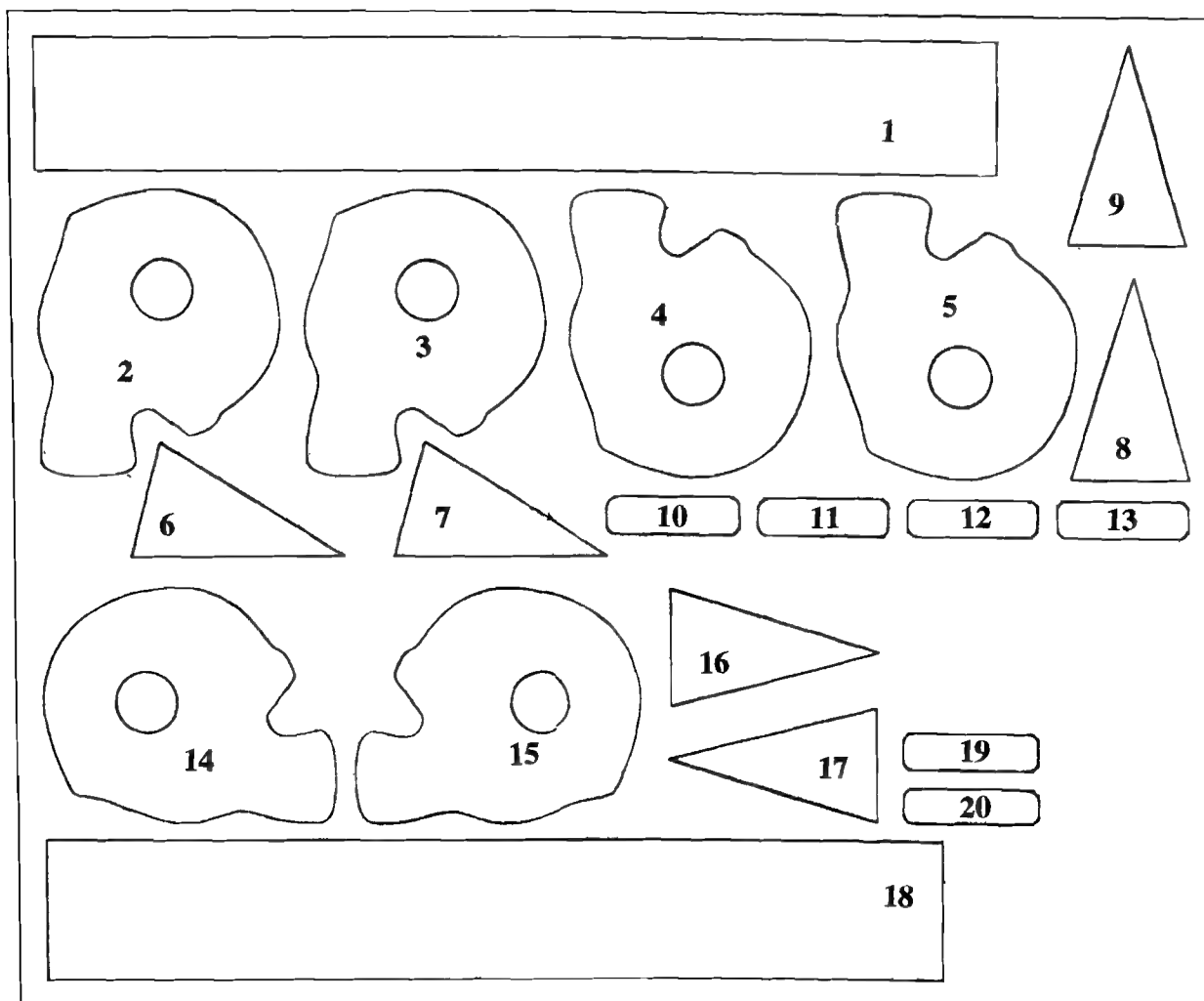


**Suggested Control Panel
Layout for Four Player
Conversion**

Match (#) with decal number on previous page.



**Suggested Control Panel
Layout for Two Player
Conversion**



4 PLAYER DECAL SET:

- (1) Four Player Instruction Card
- (2) Player One Defensive Captain (Red)
- (3) Player Two Quarterback (Red)
- (4) Player Three Quarterback (Blue)
- (5) Player Four Defensive Captain (Blue)
- (6) Start Player One (Red)
- (7) Start Player Two (Red)
- (8) Start Player Three (Blue)
- (9) Start Player Four (Blue)
- (10) Action (Red)
- (11) Action (Red)
- (12) Action (Blue)
- (13) Action (Blue)

2 PLAYER DECAL SET:

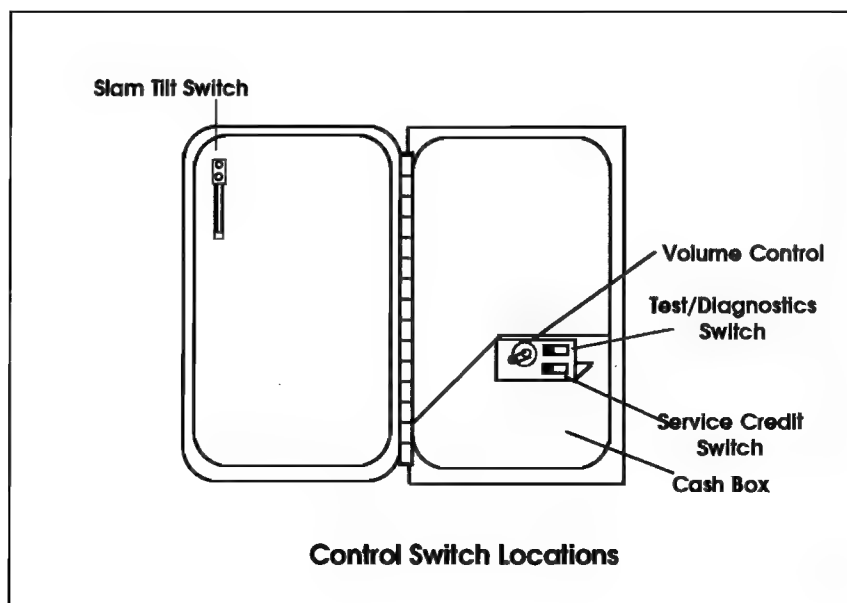
- (14) Player One Quarterback (Red)
- (15) Player Two Quarterback (Blue)
- (16) Start Player One (Red)
- (17) Start Player Two (Blue)
- (18) Two Player Instruction Card
- (19) Action (Red)
- (20) Action (Blue)

Game Operation

HIGH IMPACT FOOTBALL is a one to four player video game with a color monitor. From the player's perspective, the game has two modes of operation: Ready-to-Play and Play. For the owner/operator, the game has an additional mode of operation called Game Diagnostics and Adjustments.

Control Switches

- The **COIN DOOR SLAM TILT SWITCH** detects any forceful vibrations against the Coin Door. This eliminates pounding for free games. (**OPTIONAL SWITCH**)
- The **VOLUME CONTROL** allows increasing or decreasing the volume level of the game music and speech. For greater profits, set your game's volume level at its maximum.
- The **TEST/DIAGNOSTICS SWITCH** allows you to enter into the game's Diagnostic mode. Move the Test Switch to enter the Diagnostics Mode. To exit this mode, select EXIT TO GAME OVER from the Diagnostics main menu. (**OPTIONAL SWITCH**)
- The **SERVICE CREDIT SWITCH** is a special feature switch that allots credit without affecting the game's bookkeeping total. (**OPTIONAL SWITCH**)



Game Audits, Adjustments & Diagnostics

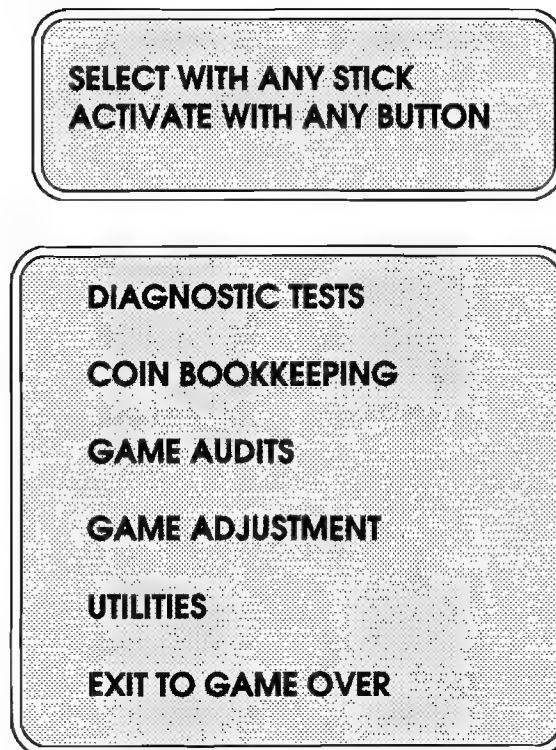
Operation

All HIGH IMPACT FOOTBALL Game Audits, Adjustments, and Diagnostics are options of the Main Test Menu. Each option, in turn, has its own menu, listing several choices that you may act upon as desired.

Move the Test Switch (on the cashbox lid panel) to activate the HIGH IMPACT FOOTBALL Adjustments and Diagnostics. Main Test Menu (shown below) then appears. Game adjustments, bookkeeping, and diagnostics are all accessible from this menu.

Move any joystick up or down to cycle through the menu options. Notice that the options are highlighted in sequence. Selecting a desired option requires it to be highlighted. To activate the selected option, press any button.

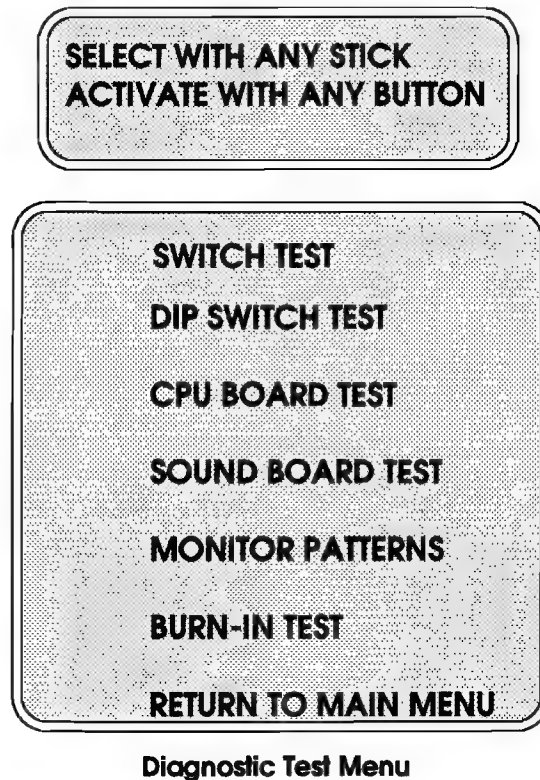
The Main Test Menu lists six options.



Main Test Menu

DIAGNOSTIC TESTS

To enter the Diagnostic Tests from the Main Test Menu, move any joystick to select (highlight) the Diagnostic Test option, and press any button to activate the option. The Diagnostic Tests Menu lists seven options.



Switch Test

The Switch Test allows the operator to test the switches on the control panel and the coin door.

Select the Switch Test by using any joystick to highlight the Switch Test option; then, press any button to activate it. The top of the screen shows a layout of the control panel and the bottom of the screen lists the coin door switches. Pressing a switch causes the corresponding switch location on the screen to light. Release the switch and the screen returns to normal.

Select the RETURN TO MAIN MENU option to return to the Diagnostic Test Menu.

DIP Switch Test

The DIP Switch Test allows the operator to check the position of the two 8-position DIP switches on the CPU Board. The operator can also change the setting of each position of each DIP switch during this mode.

Select the DIP Switch Test by moving any joystick to highlight the DIP Switch Test option; then, press any control panel button to activate the test. The screen displays a layout of the DIP switches and their current settings.

To change the setting of either DIP switch, press the switch position (SW1 - SW8) to the desired setting (ON from OFF, or vice versa). Check the screen to verify that the switch now shows the setting desired.

Press any control panel button to return to the Diagnostic Test Menu.

DIP Switch 1 Settings Table

	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8
4 Player 2 Player	Off * On							
CMOS Coinage DIP Switch Coinage		On Off *						
Coin Settings								
USA 1	Ger 1	Fr 1	Off *	Off *	Off *			
USA 2	Ger 2	Fr 2	On	Off	Off			
USA 3	Ger 3	Fr 3	Off	On	Off			
USA 4	Ger 4	Fr 4	On	On	Off			
USA ECA	Ger ECA	Fr ECA	Off	Off	On			
NU	NU	NU	On	Off	On			
NU	NU	NU	Off	On	On			
Free Play	Free Play	Free Play	On	On	On			
Not Used						Off *	Off *	Off *

DIP Switch 2 Settings Table

	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
USA	Off *	Off *						
German	On	Off						
French	Off	On						
Not Used	On	On						
Not Used			Off *					
One Counter Two Counters				Off * On				
Not Used								
Not Used								
Test Switch Game Mode Test Mode								Off * On

* Indicates Factory Setting

NOTE

As soon as a faulty chip is detected, the CPU Test stops. The remaining chips are not tested.

CPU Board Test

The CPU Board Test (much like the Start-up Test) allows the operator to check the RAMs and ROMs.

Select the CPU Board Test with any stick; then, press any button to activate the automatic test of the CPU Board's RAMs and ROMs. When this test is activated, a "rug" pattern appears on the screen. The screen then changes to show the layout of the RAMs, and ROMs on the CPU. Any chip that is shown as black with a white outline is part of the CPU and should turn either red or green during the CPU Test. Any chip that is shown as gray with a white outline is not installed in the game. During the test, chips are good, if they turn green; they are faulty, if they turn red.

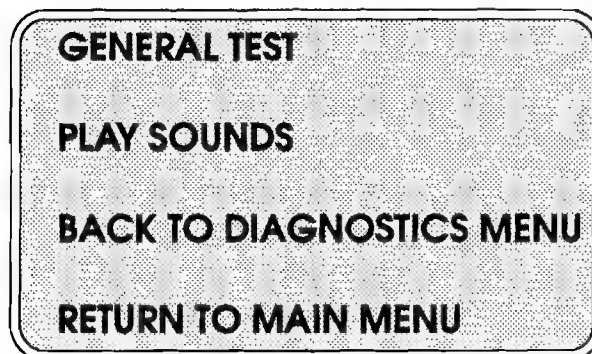
Sound Board Test

The Sound Test allows listening to some of the sounds that HIGH IMPACT FOOTBALL is capable of producing. This test also emits a tone for each fault that is detected.

Select the Sound Board Test with any stick; then, press any button to activate the test. The screen displays two test options:

GENERAL TEST analyzes the sound circuitry. A successful test causes a single "tone" to sound. Detection of a fault causes a series of tones to sound. When no tone sounds, this also indicates a Sound Board problem.

PLAY SOUNDS tests synthesized & digitized sounds from the Sound Board. Advance to the next sound by moving any stick, and press any button to return to the Sound Test Menu.



Sound Test Menu

Monitor Patterns

The Monitor Patterns Test provides a menu for testing the monitor.

Move any stick to select a test; press any button to activate the test.



Monitor Pattern Menu

The **RED**, **GREEN**, and **BLUE SCREEN** tests fill the screen with either red, green or blue.

The **COLOR BARS** test fills the screen with several gradiated colors to help with red, green and, blue level adjustments. Each color should appear sharp and clear.

The **CROSSHATCH PATTERNS** test fills the screen with a grid and a series of dots. The grid and the dots should be clear. The dots should appear round.

If any of the Monitor Pattern Tests shows a need for adjustment, use the proper white knobs on the Monitor Board.

Select Monitor Patterns Menu with any stick, and press any button to activate. From this menu, select RETURN TO MAIN MENU with any stick and activate with any button.

Burn-in Test

The Burn-in Test continually repeats the CPU Board Test. Move any any stick to select the Burn-in Test; then, press any button to activate the test. When the Burn-in Test detects an error, the test stops and displays an error message on the screen. The fourth page of the Audit Table specifies the number of Burn-in cycles successfully completed. Use this test to find intermittent CPU problems.

To exit this test, switch off the game; then, switch it on again.

COIN BOOKKEEPING

To enter the Coin Bookkeeping from the Main Test Menu, move any stick to select the Coin Bookkeeping option; then, press any button to activate it.

The Coin Bookkeeping Table records the coinbox totals and game play counters. The left side of the table names the bookkeeping item; the right side shows the number of coins, credits, or plays for each item.

LEFT SLOT COINS	0
RIGHT SLOT COINS	0
THIRD SLOT COINS	0
FOURTH SLOT COINS	0
SERVICE CREDITS	0
PAID CREDITS	0
TOTAL PLAYS	0
PLAYS UNTIL HIGH SCORE RESET	5000
MORE DETAILED DATA	
RETURN TO MAIN MENU	

Coin Bookkeeping Table

To exit Coin Bookkeeping, move any stick to select RETURN TO MAIN MENU; then, press any button to activate it.

LEFT SLOT COINS	0
RIGHT SLOT COINS	0
THIRD SLOT COINS	0
FOURTH SLOT COINS	0
TOTAL COLLECTIONS	0
CLEAR COIN METERS	
RETURN TO MAIN MENU	

Total Collection Table

GAME AUDITS

To enter Game Audits from the Main Test Menu, move any stick to select the Game Audits option; then, press any button to activate it. To advance to the next (or return to the previous) page of the Game Audit Table, move any joystick to select either "Next Audit Page", or "Previous Audit Page"; then, press any control panel button to change the page.

The Game Audits Table records the game play statistics. The left side of the table names the Audit item; the right side shows the amount of play.

TOTAL GAME UPTIME	0
TOTAL PLAY TIME	0
TIME 1 PLAYER ONLY	0
TIME 2 PLAYER SIMULTANEOUS	0
TIME 3 PLAYER SIMULTANEOUS	0
TIME 4 PLAYER SIMULTANEOUS	0
NEXT AUDIT PAGE	
RETURN TO MAIN MENU	

PAGE 1 OF AUDIT TABLE

TOTAL PLAYS	0
1 PLAYER GAME STARTS	0
2 PLAYER GAME STARTS	0
3 PLAYER GAME STARTS	0
4 PLAYER GAME STARTS	0
CONTINUES OFERED	0
CONTINUES TAKEN	0
CONTINUES REFUSED	0
GAMES PLAYED TO COMPLETION	0
NEXT AUDIT PAGE	
PREVIOUS AUDIT PAGE	
RETURN TO MAIN MENU	

PAGE 2 OF AUDIT TABLE

GAME AUDITS CONTINUED

LEFT TEAM TOUCHDOWNS	0
RIGHT TEAM TOUCHDOWNS	0
PASSES ATTEMPTED	0
PASSES COMPLETED	0
SAFTIES	0
HUMAN FIELD GOAL ATTEMPTS	0
HUMAN FIELD GOAL COMPLETIONS	0
HUMAN EXTRA POINT ATTEMPTS	0
HUMAN EXTRA POINT COMPLETIONS	0
NEXT AUDIT PAGE	
PREVIOUS AUDIT PAGE	
RETURN TO MAIN MENU	

PAGE 3 OF AUDIT TABLE

HUMAN INTERCEPTIONS	0
DRONE INTERCEPTIONS	0
BURN-IN CYCLES SUCCESSFULLY COMPLETED	0
PREVIOUS AUDIT PAGE	
RETURN TO MAIN MENU	

PAGE 4 OF AUDIT TABLE

To exit the Game Audit Table , move any stick to select RETURN TO MAIN MENU; then, press any button to activate it.

GAME ADJUSTMENTS

Move any joystick to select the Game Adjustment option on the Main Test Menu; then, press any button to activate it.

The Game Adjustments option allows the owner/operator to change the Game Pricing and Game Difficulty.

The Game Adjustment Menu offers several choices. Each choice has its own menu. Move the left joystick to select your choice to be changed from the Game Adjustments Menu; then, move right joystick to activate that choice. On the next menu screen, move the left joystick to select the item you wish to modify; then, move the right to activate that item. If the activated item only provides a setting choice, move any joystick to change the current setting to the desired value; then, press any button to lock in the desired value. Moving the joystick up increases the setting value shown on the screen. Moving the joystick down causes the value shown on the screen to decrease.

**SELECT WITH ANY STICK
ACTIVATE WITH ANY BUTTON**

**RETURN TO MAIN MENU
CREDIT TIMER
ATTRACT MODE SOUNDS
GAME CLOCK SPEED
STANDARD PRICING
CUSTOM PRICING
GAME DIFFICULTY
FREE PLAY
RETURN TO MAIN MENU**

Game Adjustment Menu

**Note, Game Adjustments
are explained in more
detail on the following
page.**

Credit Timer

Controls the speed of the player credit timer. The settings for the adjustment are:

- Slow
- Medium (factory)
- Fast

Attract Mode Sounds

Determines whether the game will make sounds in the attract mode. The settings for the adjustment are:

- Yes (factory)
- No

Game Clock Speed

Allows the operator to adjust the speed at which the game clock will countdown. The settings for the adjustment are:

- Slow
- Medium (factory)
- Fast

Standard Pricing

Standard Pricing allows the operator to choose any of the "Standard" selections for the Standard Pricing Table.

Custom Pricing

Custom Pricing allows the operator to install pricing other than that of the Standard Pricing Table. Custom Pricing also allows the operator to select the maximum amount of credits per game, the amount of credits required to start a game, and the amount of credits required to continue a game. This option is being adjusted from the Dip Switch Settings.

Game Difficulty

Game Difficulty allows the operator to select the difficulty level of the game. The settings for the adjustment are:

- Easy
- Medium (factory)
- Hard

Free Play

This option allows the operator to select free play. The settings for the adjustment are:

- No (factory)
- Yes

HIGH IMPACT FOOTBALL Standard Pricing Table

NAME	SETTING Credit/Coin	LEFT CHUTE	CENTER CHUTE	RIGHT CHUTE	FOURTH CHUTE
USA 1 USA 2 USA 3 USA 4 USA ECA	1/25¢ 1/50¢ 1/50¢, 3/\$1.00 1/50¢, 4/\$1.00 1/25¢, 4/\$1.00	25¢ 25¢ 25¢ 25¢ \$ 1.00	 10¢	25¢ 25¢ 25¢ 25¢ 25¢	 5¢
German 1 German 2 German 3 German 4 German ECA	1/1 DM, 6/5 DM 1/1 DM, 7/5 DM 1/1 DM, 8/5 DM 1/1 DM, 5/5 DM 1/1 DM, 2/2 DM, 6/5 DM	1 DM 1 DM 1 DM 1 DM 5DM	 1DM	5 DM 5 DM 5 DM 5 DM 2DM	
France 1 France 2 France 3 France 4 France ECA	2/5 F, 5/10 F 2/5 F, 4/10 F 1/5 F, 3/10 F 1/5 F, 2/10 F 1/3 X 1 F, 2/5 F, 5/2 X 5 F	5 F 5 F 5 F 5 F 1F	 10F	10 F 10 F 10 F 10 F 5F	
Swiss	1/1 F, 6/5 F	1 F		5 F	
Italy	1/500 Lire	500 Lire		500 Lire	
UK 1 UK ECA	1/20 P, 3/50 P 1/30 P, 2/50 P, 4/£1.00	20 P £1.00	 20P	50 P 50 P	 10 P
Spain 1	1/25 Peseta, 5/100 Peseta	25 Peseta		100 Peseta	
Japan 1	1/100 Yen	100 Yen		100 Yen	

If option desired is not shown above, use custom pricing .

GAME ADJUSTMENTS CONTINUED CUSTOM PRICING

**SELECT WITH ANY STICK
ACTIVATE WITH ANY BUTTON**

(1) LEFT CHUTE UNITS
(1) RIGHT CHUTE UNITS
(1) THIRD CHUTE UNITS
(1) FOURTH CHUTE UNITS
(2) UNITS/CREDIT
(3) UNITS/BONUS
(4) MINIMUM UNITS REQUIRED
(5) CREDITS TO START
(6) CREDITS TO CONTINUE
(7) COINS PER DOLLAR
MAXIMUM CREDITS
RETURN TO ADJ. MENU

- (1) Coins inserted accumulate units. This adjustment specifies the number of units given for each coin in the fourth chute (see "units/credit").
- (2) This is the number of coin units required to buy one credit.
- (3) One bonus credit is awarded after this many coin units have accumulated.
- (4) No credits will be awarded until this many coin units have accumulated.
- (5) Each player needs this many credits to begin a game.
- (6) Each player needs this many credits to continue a game.
- (7) The detailed bookkeeping screen shows total collections based on this many coins per dollar. (Set to zero to disable the display of money totals)
- (8) This is the limit for the credits counter. Additional coins inserted will be lost. (factory setting: 30)

UTILITIES

On the MainTest Menu, move any joystick to select the Utilities option; then, press any control panel button to activate it.

The Utilities option allows the owner/operator to clear the game's bookkeeping memory and to install a custom message.

**SELECT WITH ANY STICK
ACTIVATE WITH ANY BUTTON**

SET OPERATOR MESSAGE

CLEAR CREDITS

CLEAR COIN COUNTERS

CLEAR GAME AUDITS

RESET HIGH SCORE

DEFAULT ADJUSTMENTS

FULL FACTORY RESTORE

RETURN TO MAIN MENU

Utilities Menu

Move any joystick to select an item from the Utilities Menu; then, press any control panel button to activate that item. After an item has been activated, you are given the option of resetting the item or not. For example;

**CLEAR CREDITS
ARE YOU SURE ?**

**YES
NO**

Move any joystick to choose YES or NO; then, press any control panel button to lock in your choice and to return to the Utilities Menu.

To exit Utilities, move any joystick to select RETURN TO MAIN MENU; then, press any control panel button to activate it.

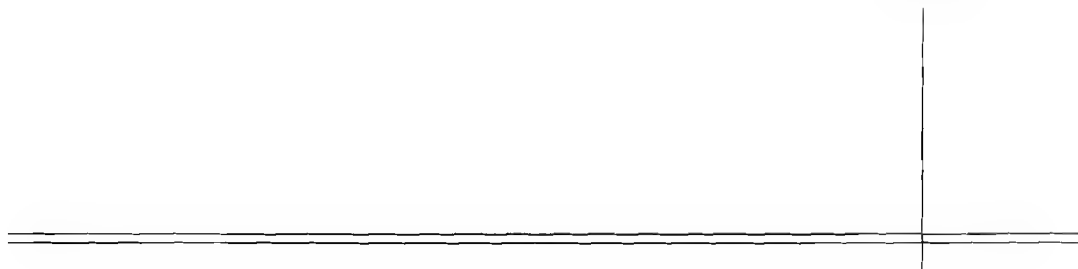
Troubleshooting

Problem	Possible Solution
NO PICTURE OR DISTORTED PICTURE.	Check for faulty video board or monitor. Check for disconnected video signal cable.
TURN GAME ON & NOTHING HAPPENS	Check line fuse. Check for +5V dc at pins C, D, 3, and 4 of the JAMMA Connector.
NO SOUND	Check the speaker and speaker connection to pins L and 10 on JAMMA Connector. Check volume control setting. Check for +12V dc at pins F and 6 on the JAMMA Connector. Check interboard wiring from CPU Board to Sound Board.
NO GENERAL ILLUMINATION	Check the 1 A., 5-B fuse on the the bottom of the cabinet below the coin box.
MOVE JOYSTICK, BUT PLAYER DOES NOT MOVE	Check for open wires between Joystick and CPU Board. Check for contamination on joystick switch contacts and CPU Board pins. Check for proper ground.
PRESS START or ACTION BUTTON AND NOTHING HAPPENS	Check for open wires between button and CPU Board. Check for contamination on CPU Board pins or button switch blade contacts. Check for proper ground.
NO CREDIT GIVEN WHEN COINS ARE INSERTED	Check DIP switch coin setting. Check for contamination on coin switch contacts. Check for an open wire between Coin Switch 1 and pin 16 on JAMMA Connector or Coin Switch 2 and pin T of JAMMA Connector.
TOO MANY CREDITS FOR NUMBER OF COINS INSERTED	Check Game Pricing setting. Check for a short between pins T & 16 on JAMMA Connector.
GAME STAYS IN THE TEST MODE.	Check that the Test Switch (if you have installed one) and the Test Switch (Position 8) on DIP Switch 2 are set to OFF.

NOTES:

HIGH IMPACT FOOTBALL KIT

S E C T I O N TWO



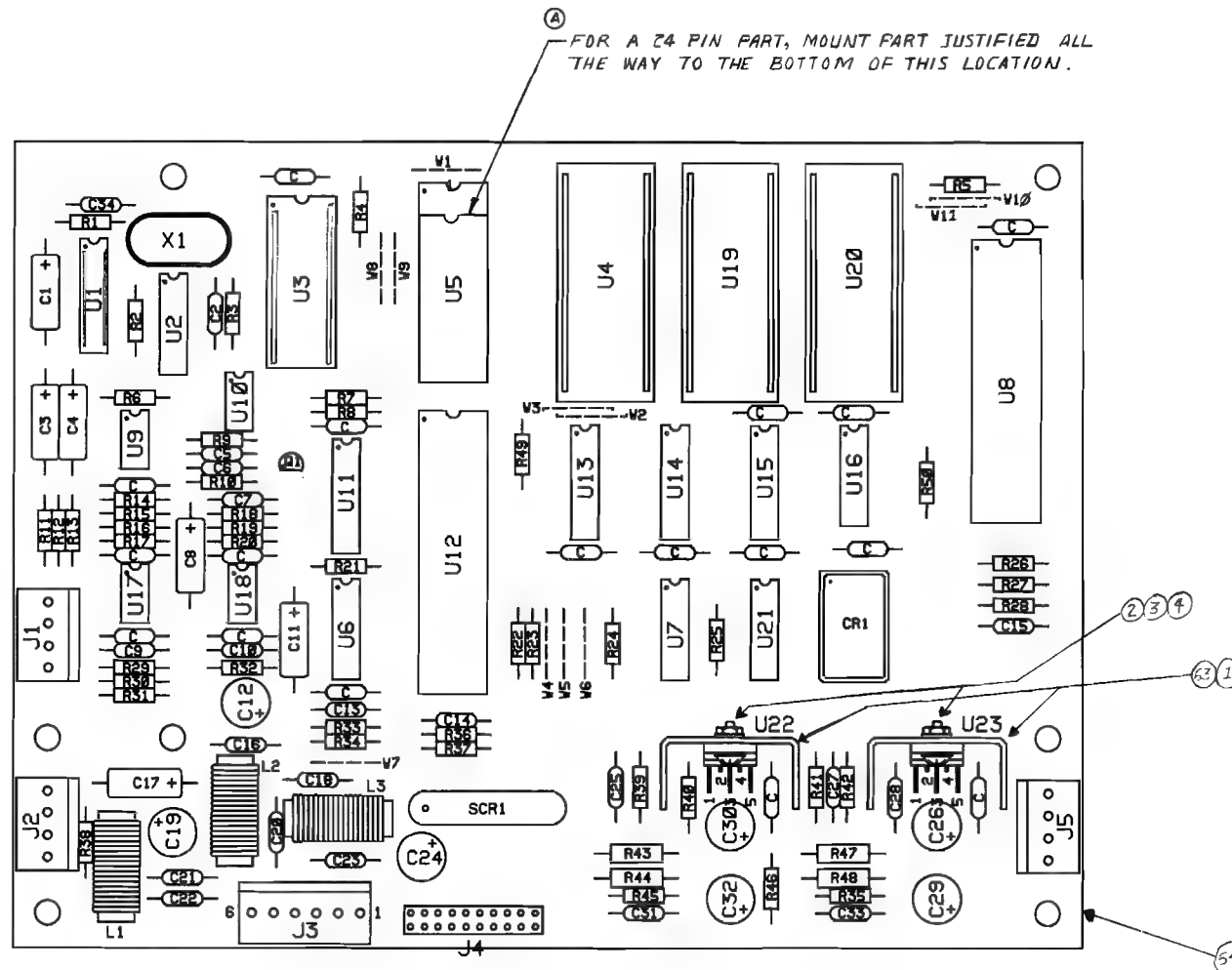
PARTS INFORMATION

REV	DESCRIPTION OF CHANGE	ECN NO
	NDP 8-27-90 24725	
A	ADDED 24 PIN RAM 9-6-90 24887	
	INFO. ALSO SEE SHEET 2. 9-17-90	

AUDIO BOARD ASSEMBLY
A-13971-40004

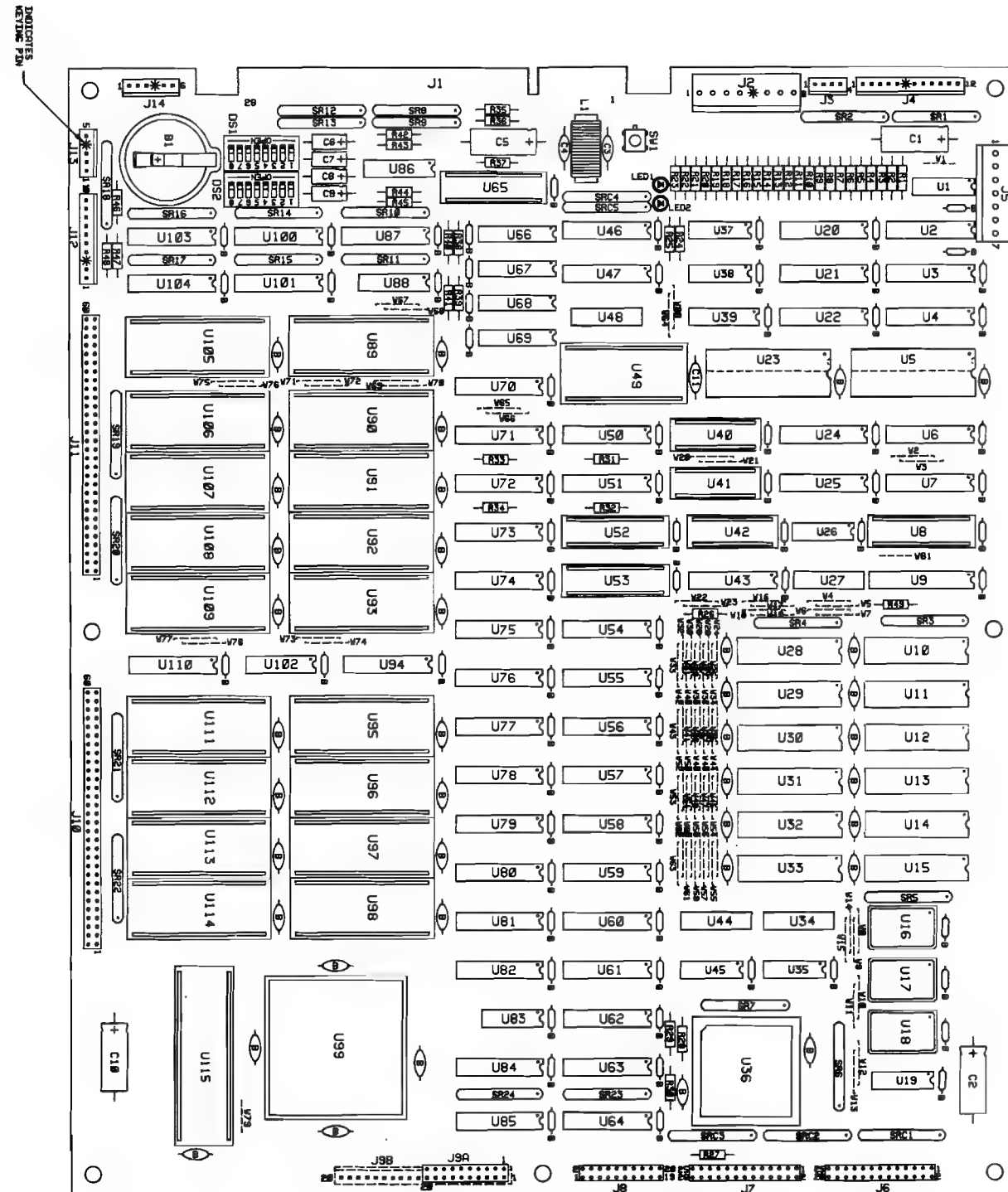
Item Part Number Designation Description

1	20-9229		Thermal Compound
2	4006-01113-06		#6-32 x 3/8 P-PH-S
3	4406-01128-00		#6-32 Hex Nut
4			
5	5010-08772-00	R18	RES. 15K 1/4 W 5%
6	5010-08824-00	R32	RES. 43K 1/4 W 5%
7	5010-08846-00	R31	RES. 220K 1/4 W 5%
8	5010-08983-00	R7, R8, R9	RES. 3.3K 1/4 W 5%
9	5010-08991-00	R1, R4, R5, R11, R12, R25 - R28, R33, R36, R37, R49, R50	RES. 4.7K 1/4 W 5%
10	5010-08998-00	R2, R3	RES. 2.2K 1/4 W 5%
11	5010-09034-00	R17, R22 - R24, R34	RES. 10K 1/4 W 5%
12			
13	5010-09161-00	R35, R45	RES. 2.2 Ω 1/4 W 5%
14	5010-09162-00	R39	RES. 100K 1/4 W 5%
15	5010-09179-00	R10	RES. 3.3M 1/4 W 5%
16	5010-09181-00	R44, R48	RES. 1 Ω 1/2 W 5%
17	5010-09219-00	R38	RES. 8.2K 1/4 W 5%
18	5010-09324-00	R6, R19, R20, R21	RES. 27K 1/4 W 5%
19	5010-09331-00	R16	RES. 13K 1/4 W 5%
20	5010-09333-00	R29	RES. 180K 1/4 W 5%
21	5010-09342-00	R30	RES. 36K 1/4 W 5%
22	5010-09358-00	R41, R42	RES. 1K 1/4 W 5%
23	5010-09361-00	R43, R46, R47	RES. 220 Ω 1/2 W 5%
24	5010-10258-00	R40	RES. 1M 1/4 W 5%
25	5010-10885-00	R14, R15	RES. 20K 1/4 W 5%
26	5013-09427-00	R13	RES. 4.99K 1/4 W 5%
27	5040-09343-00	C1, C3, C4, C8, C17	CAP. 10M 20V +/- 20%
28	5040-09365-00	C11	CAP. 1M 63V +/- 50% -10%
29	5040-09776-00	C26, C30	CAP. 470M 16V +/- 50% -10%
30	5040-10974-00	C12, C19, C24	CAP. 100M 35V
31	5040-12006-00	C29, C32	CAP. 1000M 16V 20% RD.
32	5041-09243-00	C25, C28	CAP. 10M 10V +/- 10%
33	5043-08980-00	C5, B(17)	CAP. .01M 50V +/- 80% -20%
34	5043-08986-00	C31, C33	CAP. 1M 50V +/- 20%
35	5043-09065-00	C13, C14, C15	CAP. 470P 50V +/- 20%
36	5043-09492-00	C2, C34	CAP. 100P 50V +/- 20%
37	5043-09844-00	C8	CAP. 47P 50V +/- 20% AX
38	5043-09845-00	C16, C18, C20 - C23, C27	CAP. 1KP 50V +/- 20% AX
39	5046-09346-00	C7	CAP. 1200P 50V +/- 5%
40	5046-09350-00	C9	CAP. 180P 100V +/- 5%
41	5048-10892-00	C10	CAP. 4700P 50V +/- 10%
42	5060-10396-00	SP1	SIP 4.7K 470P 8RBC
43	5160-10269-00	Q1	TRANS 2N3904 NPN
44	5281-09215-00	U2	IC 74LS04 HEX INV
45	5281-09235-00	U21	IC 74LS10 TRPL NAN
46	5281-09246-00	U14	IC 74LS139 2-4 DEC
47	5281-09487-00	U7, U16	IC 74LS74 DUAL D F/F
48	5281-09745-00	U15	IC 74LS138 DMLTPX
49	5281-10043-00	U13	IC 74LS175
50	5340-10139-00	U5	RAM/S 5516-2 2IX8
51	5370-09156-00	U22, U23	IC 2002 AUD AMP
52	5370-09321-00	U9, U10, U17, U18	IC 1458 OP - AMP
53	5370-09691-00	U6	IC 55536-9 CVSD
54	5371-09152-00	U11	IC 1408 D/A CONV
55	5430-10322-00	U12	IC 68B21 PIA 2MHz
56	5520-09020-00	X1	Crystal 3.58MHz
57	5521-10931-00	CR1	OSC 8 MHz
58	5551-09822-00	L1, L2, L3	IND 4.7 UH 3A
59	5700-08985-00	U8	Socket IC 40 Pin
60	5700-09004-00	U3	Socket IC 24 Pin
61	5700-09006-00	U1	Socket IC 16 Pin
62	5700-12088-00	U4, U19, U20	Socket IC 32 Pin
63	5705-09199-00		Heat Sink #6030B
64	5766-12702-00		PCB Audio System
65	5791-09437-00	J4	20 HCN 2x10 ST
66	5791-10862-04	J1, J2, J5	4H STR SQ. Pin .156
67	5791-10862-06	J3	6H STR SQ. Pin .156



ITEM	PART NUMBER	DESCRIPTION	QTY	ITEM	PART NUMBER	DESCRIPTION	QTY
THE INFORMATION CONTAINED ON THIS DRAWING IS CONFIDENTIAL PROPERTY OF THE COMPANY. IT MAY NOT BE USED OR DISCLOSED TO OTHERS WITHOUT WRITTEN PERMISSION.							
PROJ ENGR. C. BLEICH		DO NOT SCALE! WORK TO DIMENSIONS SHOWN		REMOVE BURRS-BREAK SHARP CORNERS & EDGES		TOLERANCES UNLESS OTHERWISE SPECIFIED DECIMAL .X \pm .030 ANGULAR \pm 1/2°	
DWN BY J. JACOB		DATE 6/5/91		FIRST PROJECT NO 40004		MATERIAL	
CHECKED BY		DATE 7/2/91		FIRST USAGE A-13971		QTY 1	
APPROVAL C. M. M.		DATE 8/24/91		FIRST USAGE A-13971		QTY 1	
WILLIAMS ELECTRONICS GAMES, INC. 3401 N. CALIFORNIA AVE. CHICAGO, IL 60618				MIDWAY MANUFACTURING COMPANY			
NAME AUDIO SOUND SUB-ASSY				SCALE 1 OF 2			
PART NO A-13970-				REV A			

Y-UNIT CPU BOARD



Y-UNIT CPU ASSEMBLY p/n C-13234-40004

Part No.	Ckt. Designator	Description	Part No.	Ckt. Designator	Description
5770-12555-00		Bare PC Brd.	5019-09362-00	SR3, SR4, SR6	SIP, 4.7KΩ
5281-09737-00	U1	IC, 74LS 86		SR7, SR11, SR15	
5317-12211-00	U2, U20, U24, U43	IC, 74ALS541		SR17, SR19-SR24	
	U61, U62, U70	74ALS574		SRC1-SRC3	
5317-12212-00	U3, U6, U7, U21, U25		5019-10143-00	SR5	SIP, 470Ω 9 Res.
	U50, U58, U63, U64		5060-10396-00	SRC4, SRC5	SIP, 4.7KΩ 470pf
	U71, U72, U74, U79, U84, U85			SRC10, SRC14	
5317-12208-00	U4, U22, U54-U57	74ALS245		SRC16	
	U59, U60, U75-U78		5671-09019-00	LED1, LED 2	LED, Red
	U80, U81, U94, U110		5551-09822-00	L1	Inductor, 4.7UH
5340-12242-00	U5, U23	IC, 8K x 8 S RAM	5645-09025-00	DS1, DS2	DIP. Sw. 16 pin
5700-12047-00	U8, U52, U53, U65	24 pin Socket	5641-12551-00	SW1	Pushbutton Sw.
5340-12213-00	U10, U11, U28-U33	IC, 4461 VRAM	5881-12315-00	B1	Battery Holder
5521-10421-00	U16	40 MHZ Xtal	5791-10862-00	J2	8 pin Connector
5521-10318-00	U17	24 MHZ Xtal	5791-12461-00	J4	12 pin Connector
5283-10468-00	U19, U45	IC, 74F74	5791-10850-00	J6, J7	26 pin Ribbon Connector
			5791-09437-00	J8	20 pin Ribbon Connector
5019-10849-00	U27, U34, U44, U48	100Ω DIP Res.	5791-12461-10	J12	10 pin Connector
5317-12305-00	U35	IC, 74ALS00	5791-12461-05	J13	5 pin Connector
5700-12253-00	U36	68 pin Socket	5700-12252-00	U12-U15	24pin Connector
5280-09309-00	U37	IC, 7407			
5281-09487-00	U38	IC, 74LS74			
5434-12255-00	U39	IC, MAX691			
5700-09915-00	U40-U42	20 pin Socket			
5311-12287-00	U47, U46, U87, U100	IC, 74HC541			
	U101, U103, U104				
5700-10176-00	U49	28 pin Socket			
5311-12285-00	U51, U73, U82	IC, 74HC573			
5340-12014-00	U66-U69	IC, 4464 DRAM			
5283-10552-00	U83	IC, 74F04			
5370-12602-00	U86	IC, ULN2064B			
5317-12023-00	U88	IC, 74ALS138			
5700-12088-00	U89-U93, U95-U98	32 pin Socket			
	U105-U109, U111-U114				
5700-12254-00	U99	144 pin Socket			
5317-12024-00	U102	IC, 74ALS139			
5700-08985-00	U115	40 pin Socket			
5010-08991-00	R1, R24, R27	Res. 4.7KΩ 5% 1/4W			
5010-10204-00	R2, R7, R12	Res. 1KΩ 2% 1/4W			
5010-10205-00	R3, R8, R13	Res. 2KΩ 2% 1/4W			
5010-10000-00	R4, R9, R14	Res. 3.9KΩ 5% 1/4W			
5010-09219-00	R5, R10, R15	Res. 8.2KΩ 5% 1/4W			
5010-08772-00	R6, R11, R16	Res. 15KΩ 5% 1/4W			
5010-09001-00	R23, R25	Res. 330Ω 5% 1/4W			
5010-09036-00	R50, R51	Res. 100Ω 5% 1/4W			
5010-09416-00	R35-R37, R46-R48	Res. 470Ω 5% 1/4W			
5010-08997-00	R38-R45	Res. 2.7KΩ 5% 1/4W			
5010-09534-00	W2, W8, W11, W12, W14, W21, W22, W24, W27, W29, W31, W32, W34, W36, W39, W41, W45, W47, W48, W50, W42, W52, W55, W57, W60, W62, W66, W68, W58, W69, W71, W73, W75, W77, W80	Res. 0Ω			
5043-08980-00	B	Cap. .01 μfd 10V			
5040-08986-00	C1, C2, C5, C10	Cap. 100μfd 10V			
5043-09845-00	C3, C4	Cap. .001μfd 10V			
5041-09243-00	C6-C9	Cap. 10μfd 10V			
5043-08996-00	C11	Cap. .1μfd			
5019-12611-00	SR1, SR2, SR8	SIP, 470Ω 5 Res.			
	SR9, SR12, SR13, SR18				

HIGH IMPACT FOOTBALL KIT

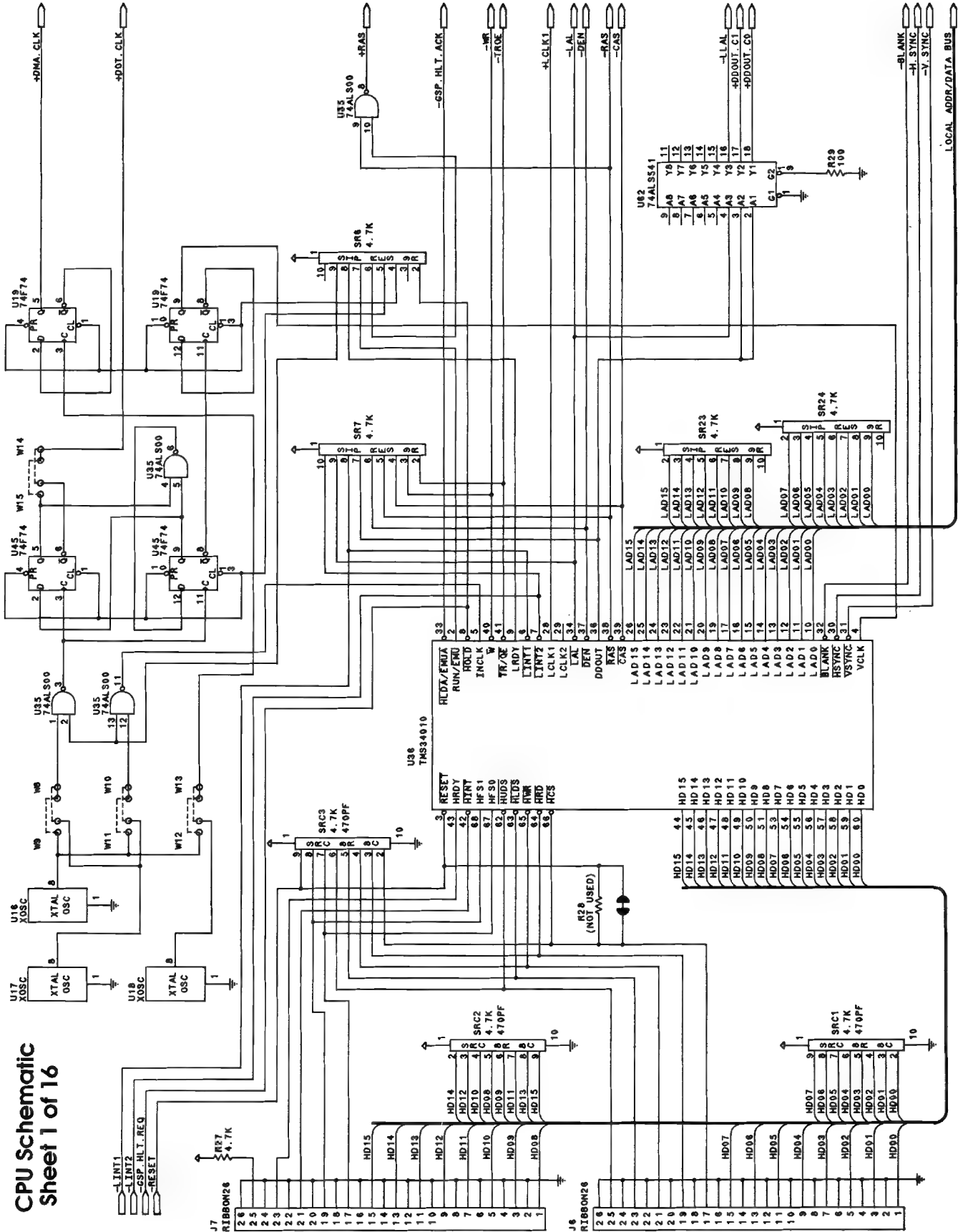
S E C T I O N THREE



DIAGRAMS & SCHEMATICS

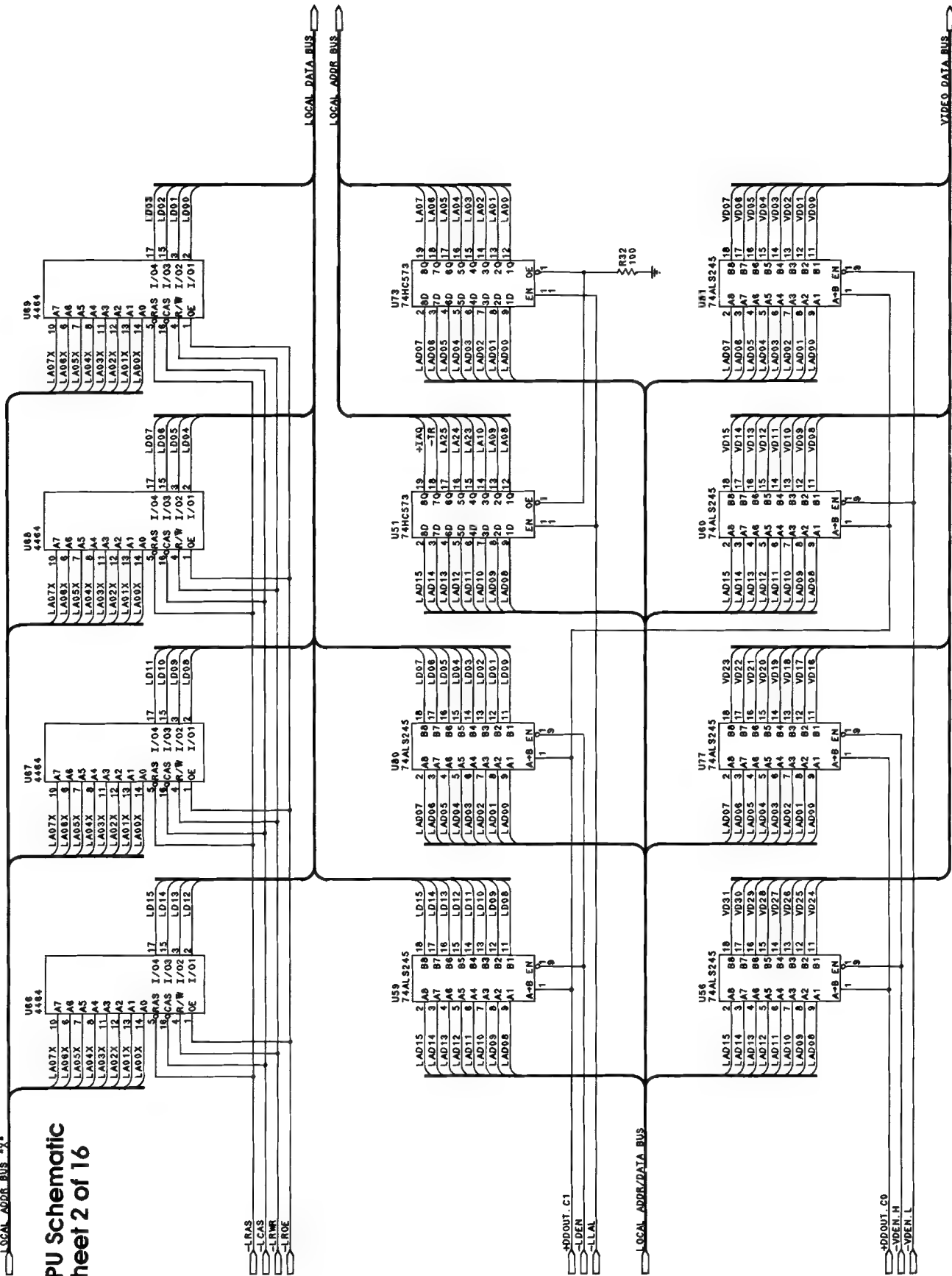


CPU Schematic Sheet 1 of 16



LOCAL ADDR BUS -X*

CPU Schematic Sheet 2 of 16



Schematic
Sheet 3 of 16

LOCAL ADDR/DATA BUS

VIDEO ADDR BUS "Y"

VIDEO ADDR BUS "X"

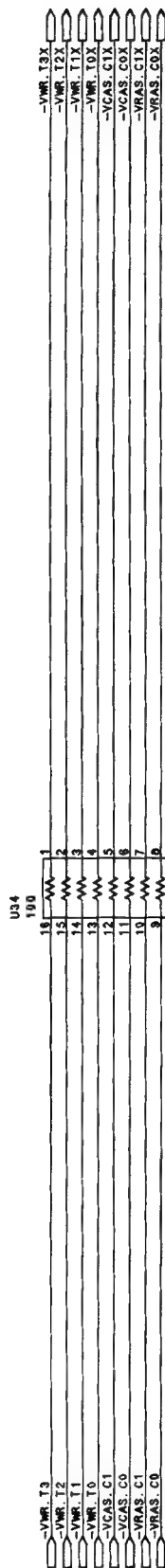
U82 74HC573
LAD06 2 80 80 19 VA08
LAD07 3 70 70 16 VA07
LAD08 4 60 60 17 VA06
LAD09 5 50 50 18 VA05
LAD0A 6 40 40 15 VA04
LAD0B 7 30 30 14 VA03
LAD0C 8 20 20 13 VA02
LAD0D 9 10 10 12 VA01

U83 74F04
EN OE 1 1

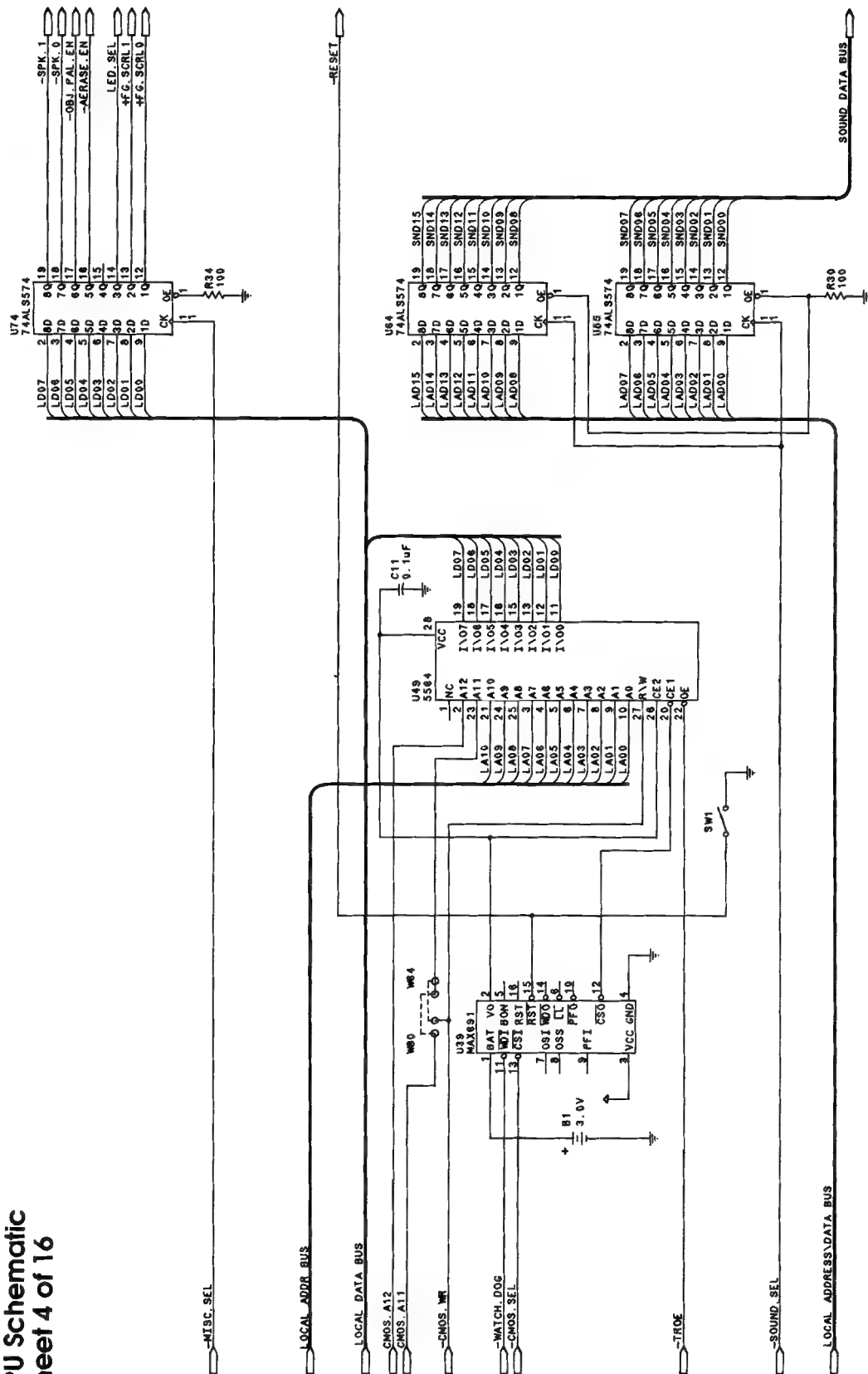
U44 100
VA08 9
VA05 10
VA04 11
VA03 12
VA02 13
VA01 14
VA00 15
VA07 16
VA06 17
VA05 18
VA04 19
VA03 20
VA02 21
VA01 22
VA00 23

U45 YADRDCEC
VCS 16
XCS 17
LCS 18
MCS 19
PCS 20
ICS 21
CCS 22
BCS 23
DCS 24

U41 YVRAMCTL
13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941

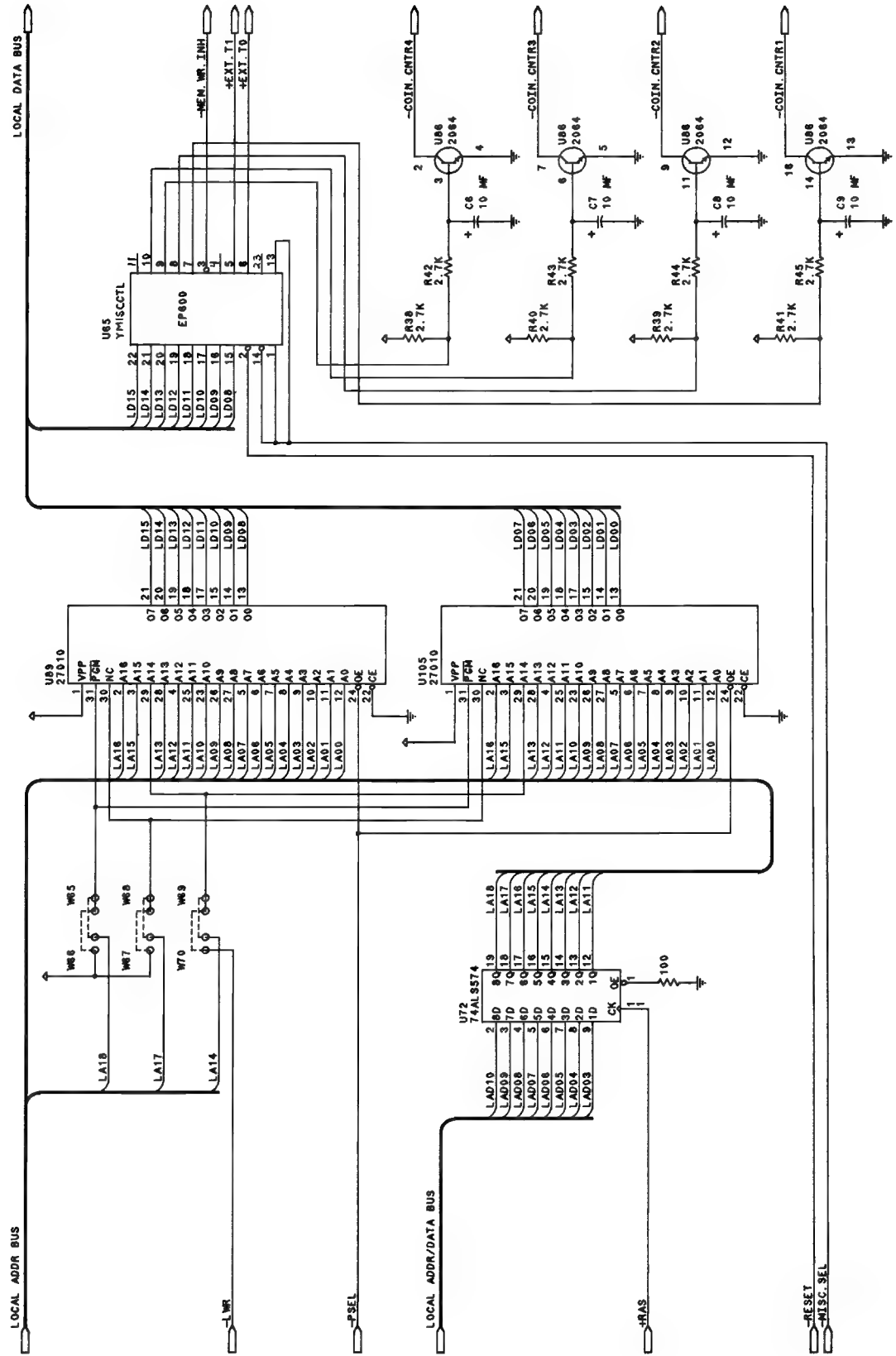


CPU Schematic Sheet 4 of 16



CPU Schematic Sheet 5 of 16

PROGRAM MEMORY





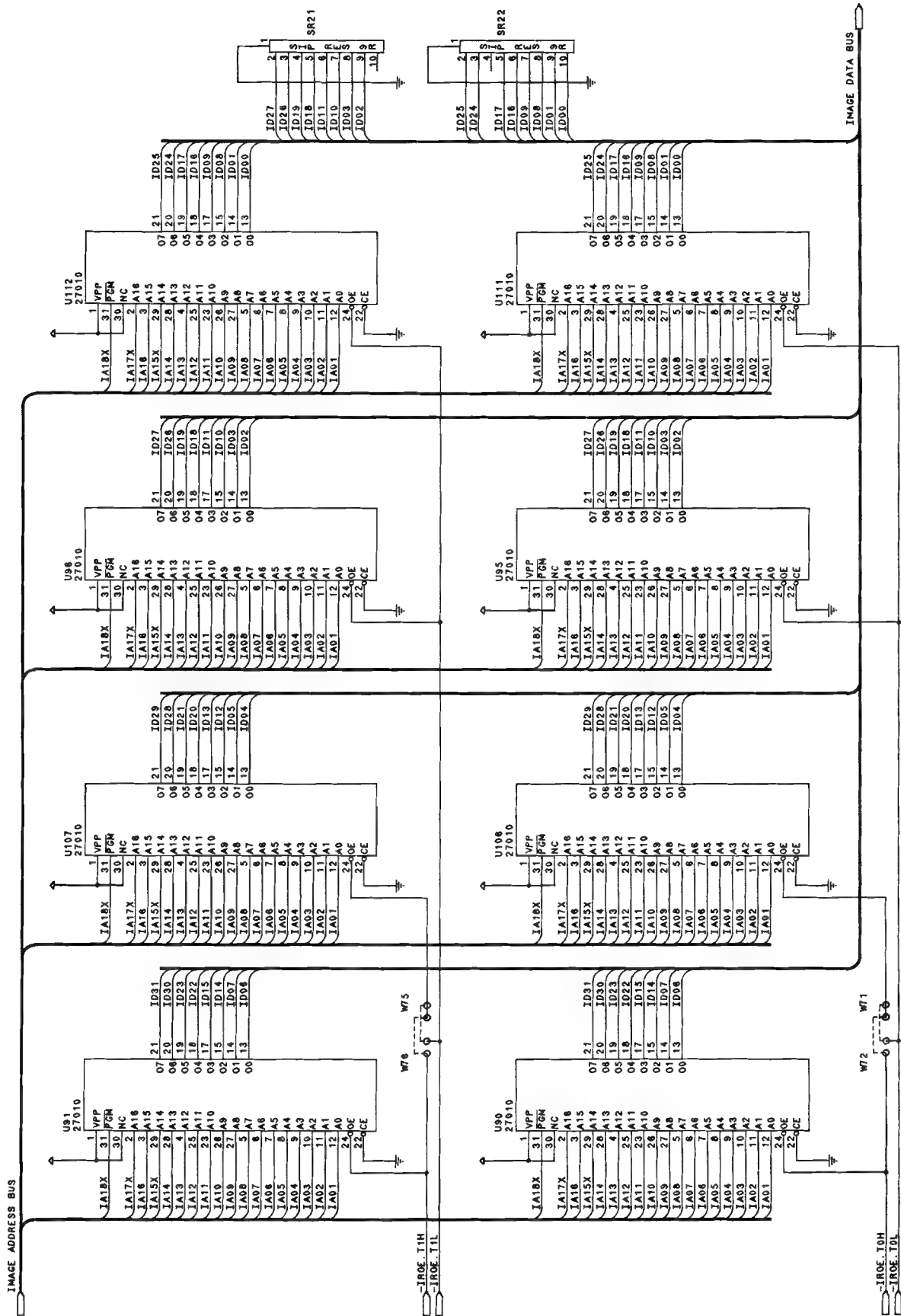
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IMAGE MEMORY



CPU Schematic Sheet 9 of 16

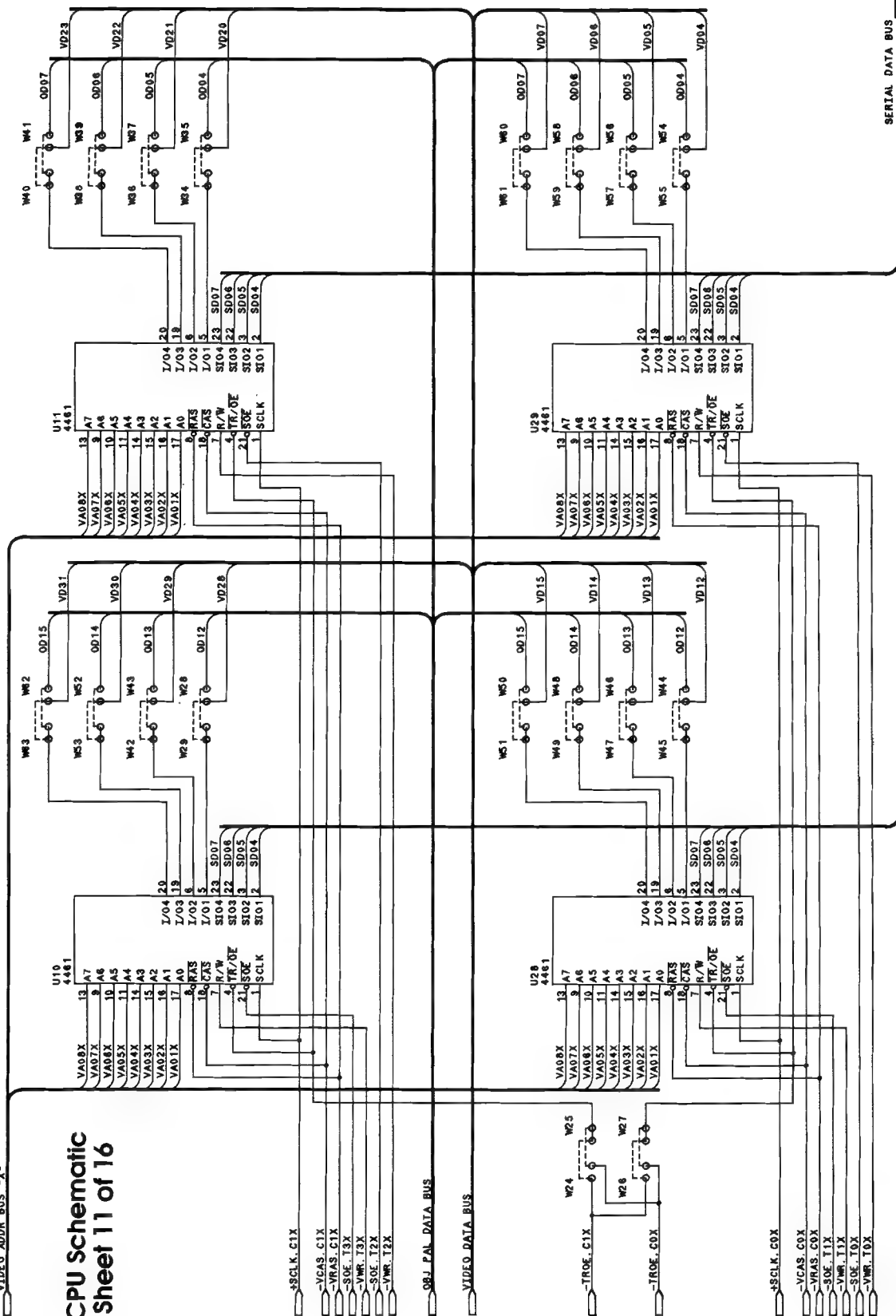
IMAGE MEMORY

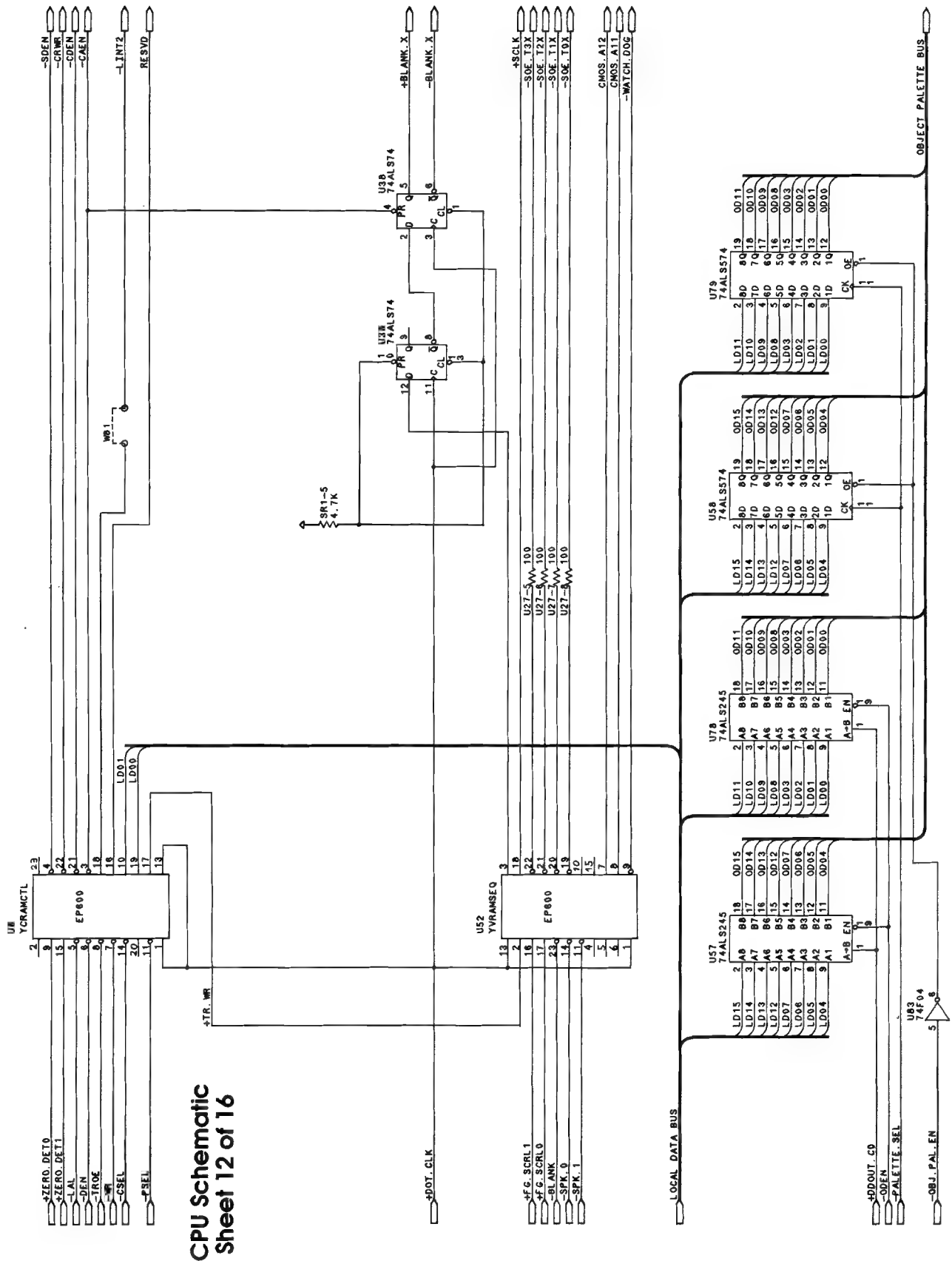


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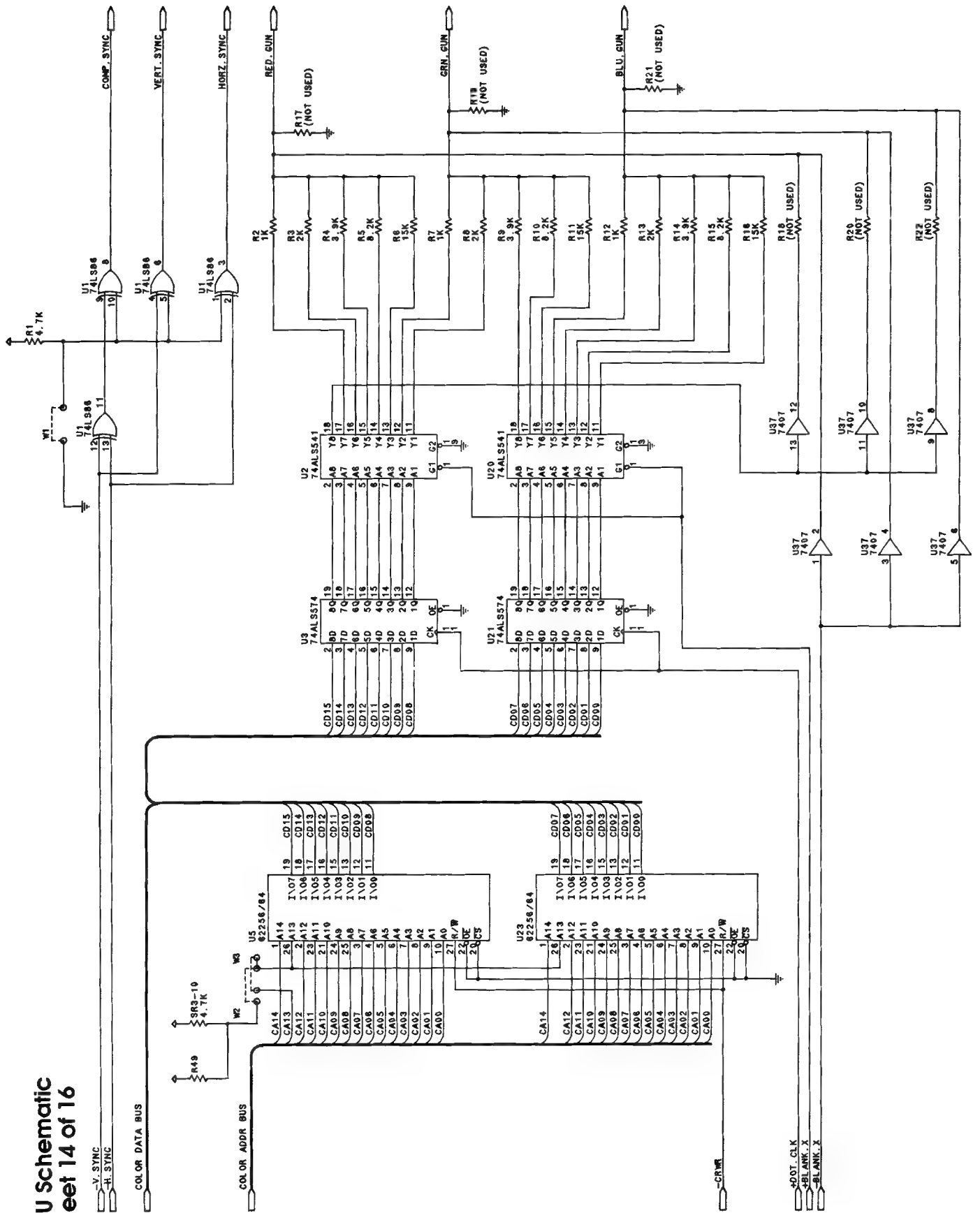
VIDEO ADDR BUS "X"

CPU Schematic Sheet 11 of 16

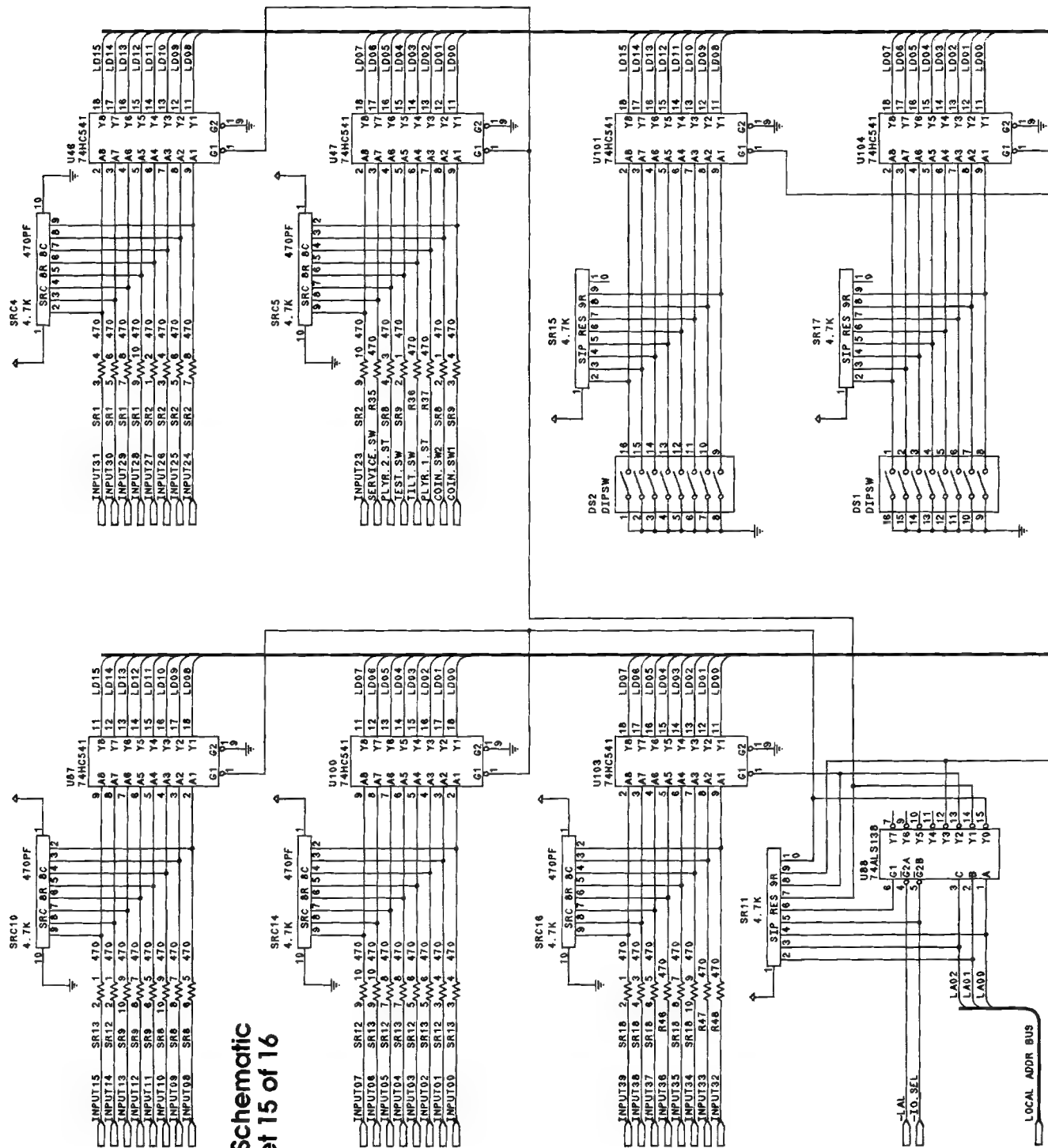




CPU Schematic Sheet 14 of 16

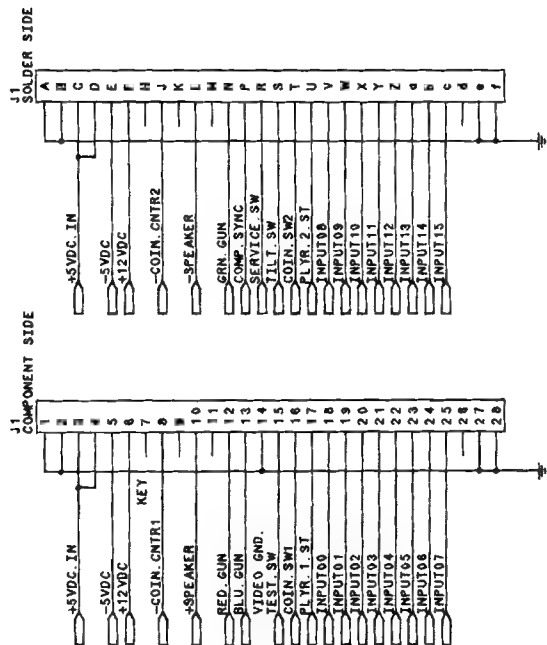


CPU Schematic Sheet 15 of 16

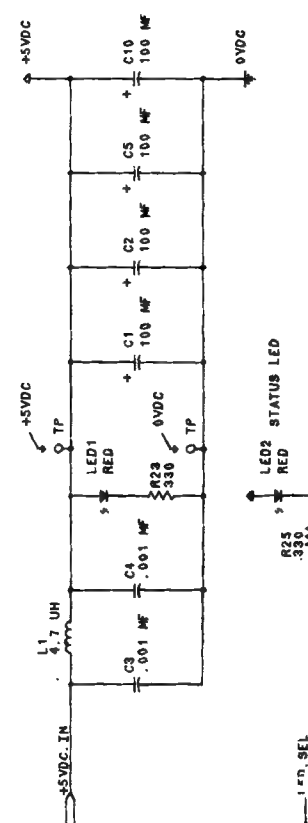
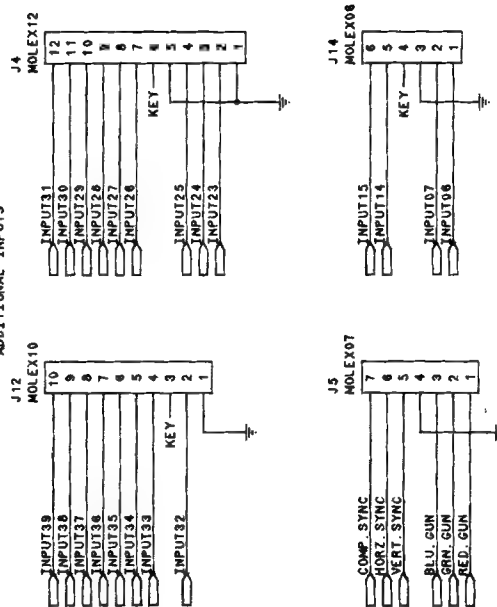


CPU Schematic Sheet 16 of 16

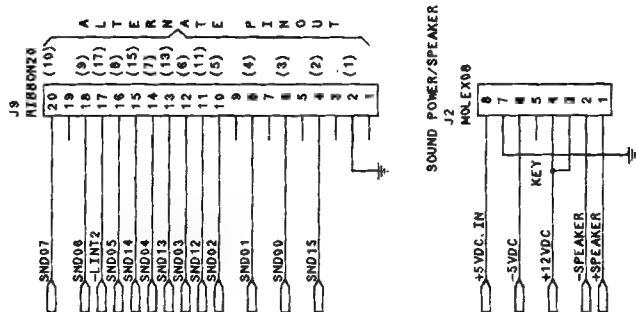
JANNA INTERFACE



ADDITIONAL INPUTS

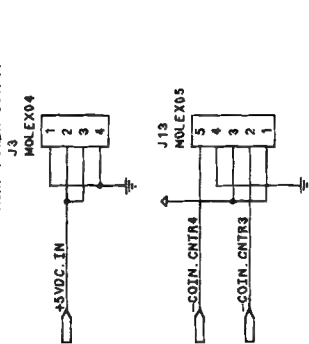


INTERRUPT INTERFACE

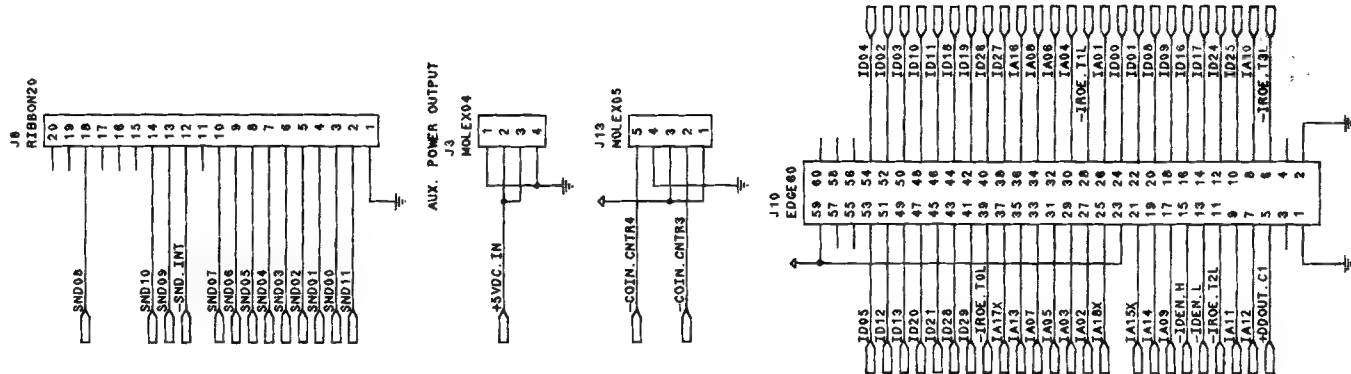


SOUND POWER/SPK

AUX. POWER OUTPUT



SOUND BOARD INTERFACE

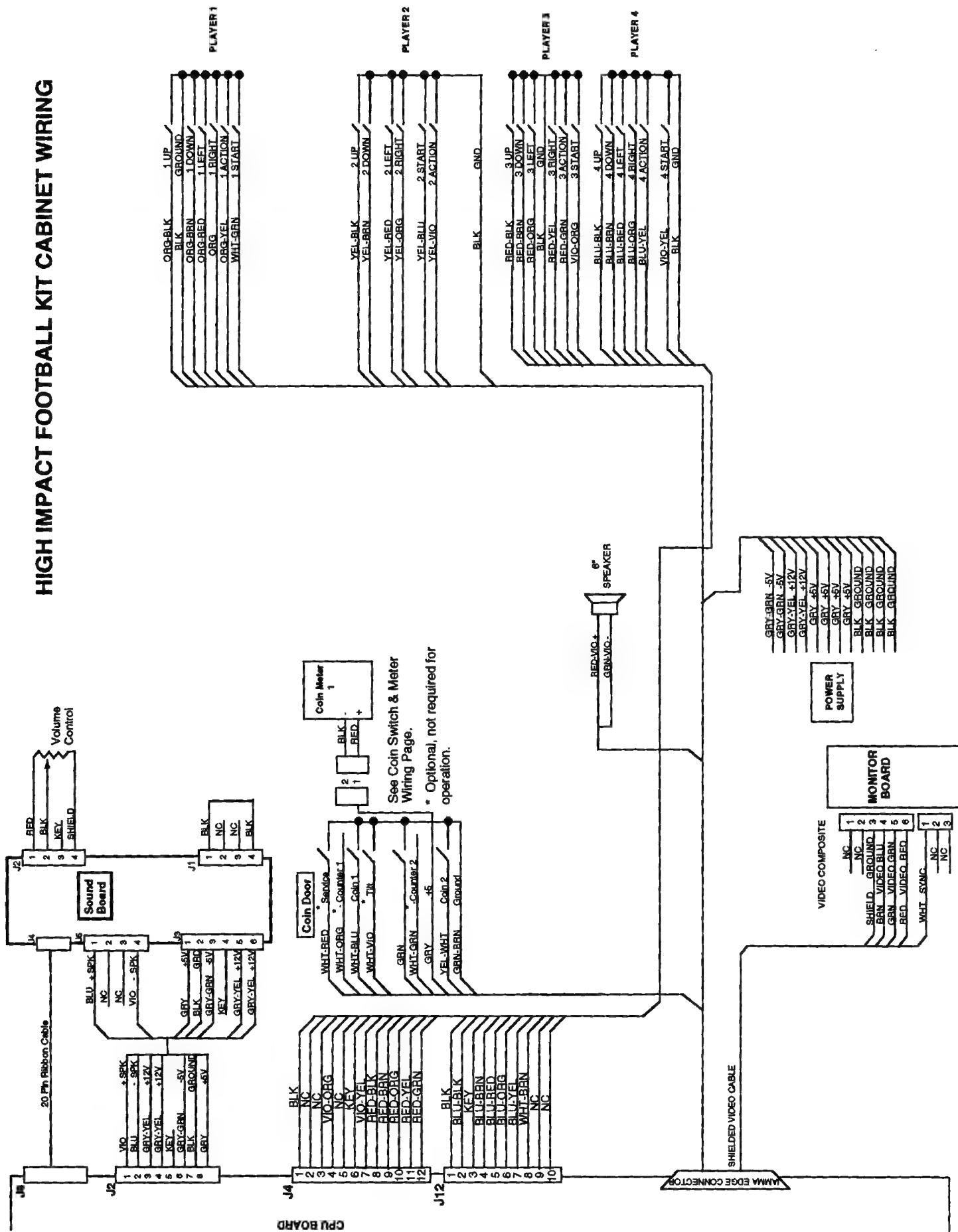


HIGH IMPACT FOOTBALL KIT **JAMMA Chart**

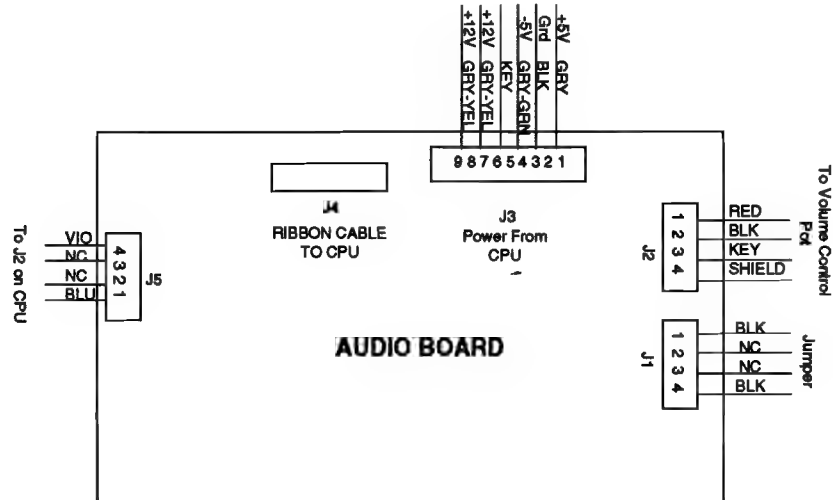
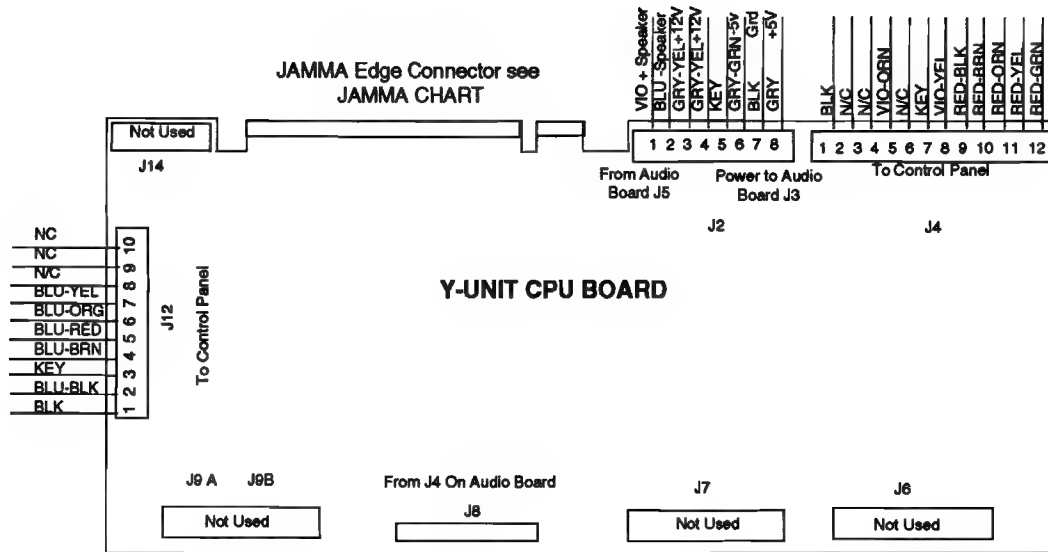
FUNCTION	WIRE COLOR	PIN	PIN	WIRE COLOR	FUNCTION
Ground	Blk <i>Brn</i>	1	A	Blk <i>Brn</i>	Ground
Ground	Blk <i>Brn</i>	2	B	Blk <i>Brn</i>	Ground
+5 Volts DC	Gry <i>red</i>	3	C	Gry <i>red</i>	+5 Volts DC
+5 Volts DC	Gry <i>red</i>	4	D	Gry <i>red</i>	+5 Volts DC
-5 Volts DC	Gry-Grn <i>orn</i>	5	E	Gry-Grn <i>orn</i>	-5 Volts DC
+12 Volts DC	Gry-Yel <i>yel</i>	6	F	Gry-Yel <i>yel</i>	+12 Volts DC
	Key	7	H	Key	
Counter 1 *	Wht-Orn <i>brn</i>	8	J	Wht-Grn <i>purp</i>	Counter 2 *
	NC	9	K	NC	
Speaker (+)	Red-Vio <i>wh</i>	10	L	Grn-Vio <i>brn</i>	Speaker (-)
	NC	11	M	NC	
Video Red	Red <i>red</i>	12	N	Grn <i>grn</i>	Video Grn
Video Blue	Brn <i>blu</i>	13	P	Wht <i>brn</i>	Video Sync
Video Grd	Shield <i>blk</i>	14	R	Wht-Red <i>gray</i>	Service Credit *
Test *	Grn <i>wh</i>	15	S	Wht-Vio	Slam Tilt *
1 Coin	Wht-Blu <i>yel</i>	16	T	Yel-Wht <i>brn</i>	2 Coin
1 Start	Yel-Grn <i>wh</i>	17	U	Yel-Blu <i>yel</i>	2 Start
1 Up	Org-Blk <i>v</i>	18	V	Yel-Blk <i>y</i>	2 Up
1 Down	Org-Brn <i>v</i>	19	W	Yel-Brn <i>y</i>	2 Down
1 Left	Org-Red <i>v</i>	20	X	Yel-Red <i>y</i>	2 Left
1 Right	Org <i>v</i>	21	Y	Yel-Org <i>y</i>	2 Right
1 Action	Org-Yel <i>v</i>	22	Z	Yel-Vio <i>y</i>	2 Action
NC	Org-Grn <i>v</i>	23	a	Yel-Gry <i>y</i>	NC
NC	Org-Blu	24	b	Vio-Blk	NC
NC	Org-Vio	25	c	Vio-Brn	NC
NC	Org-Gry	26	d	Vio-Red	NC
Ground	NC	27	e	Blk	Ground
Ground	Blk	28	f	Blk	Ground

* Optional function- Game will operate without these.

HIGH IMPACT FOOTBALL KIT CABINET WIRING

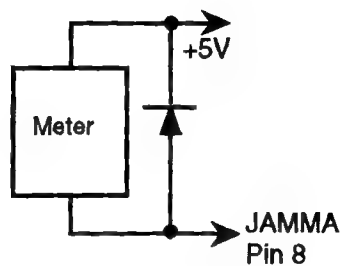
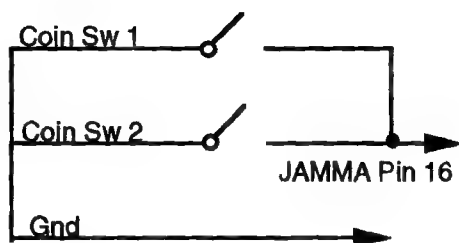


HIGH IMPACT FOOTBALL KIT INTERBOARD WIRING

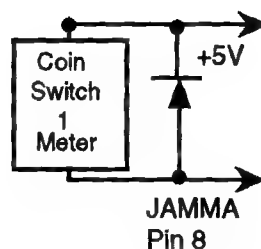
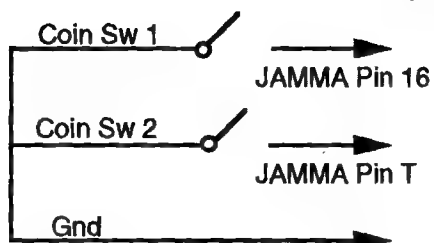


Coin Switch and Meter Wiring

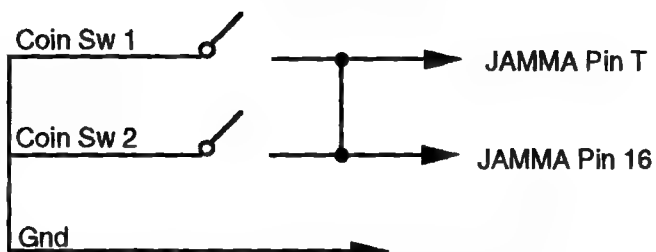
Option 1



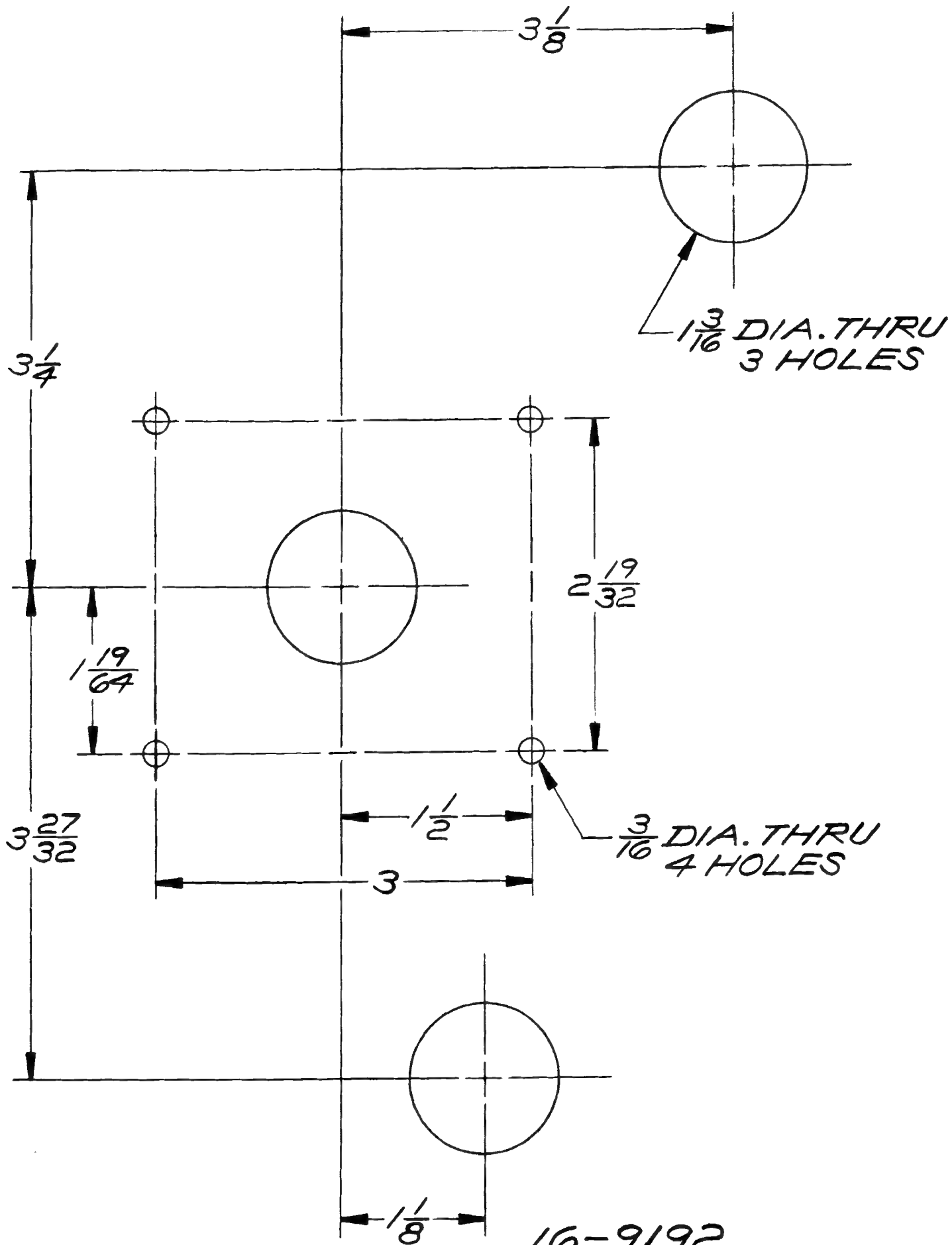
Option 2



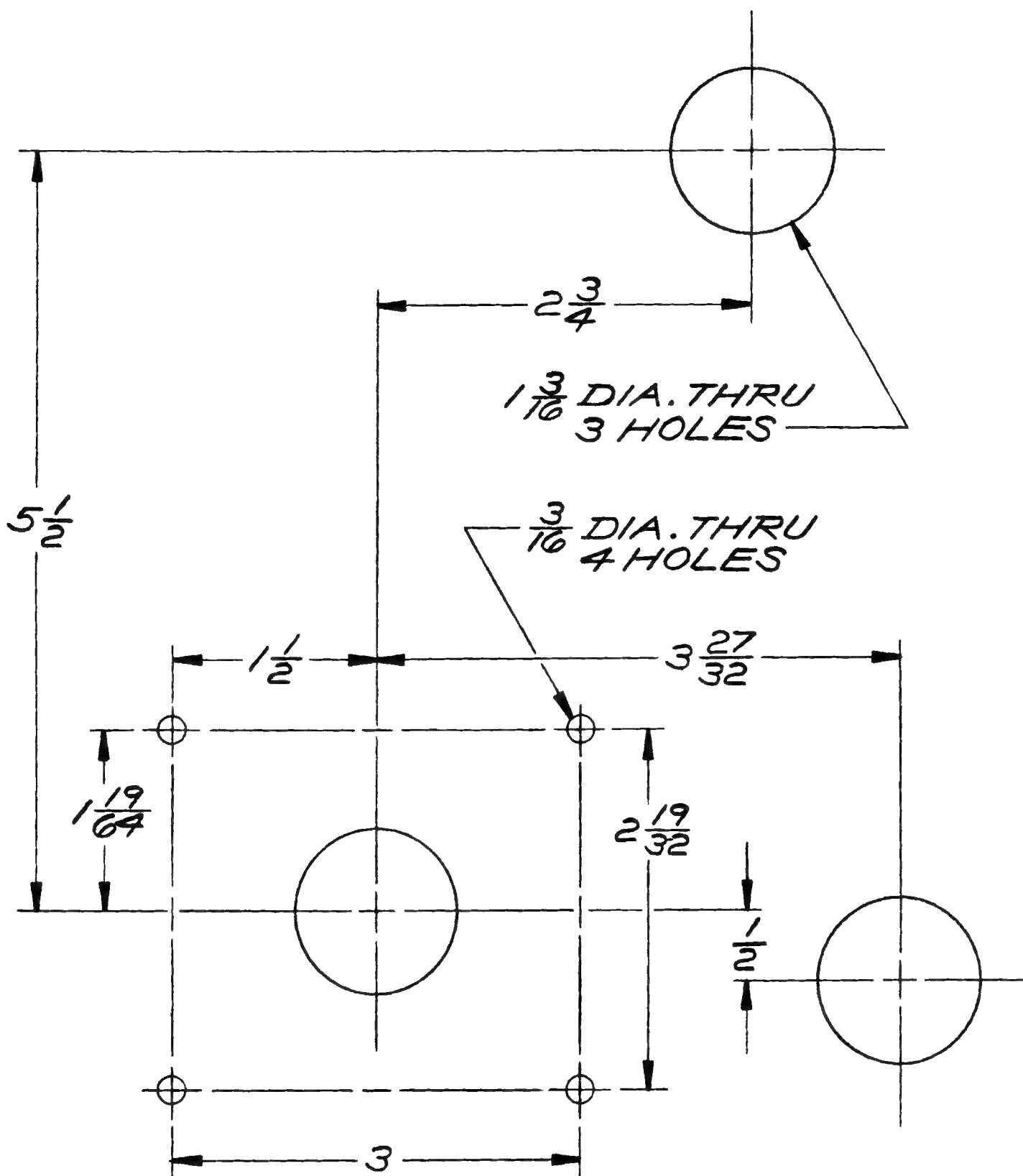
Wrong Way !



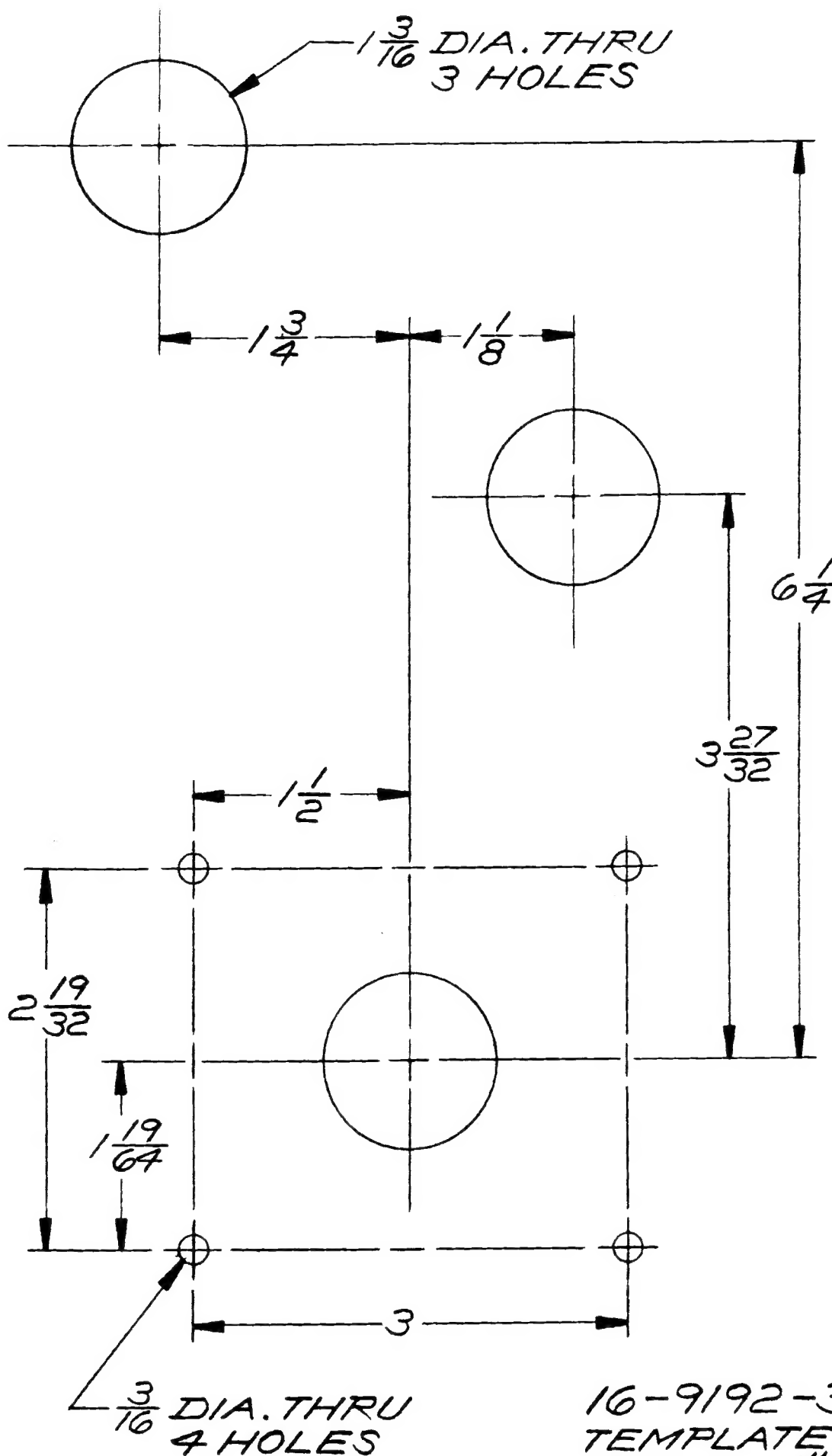
**Do NOT Connect the coin switches this way.
This Circuit is INCORRECT and will cause twice as
many credits per coin.**



16-9192
 TEMPLATE CONTROLS
 PLAYER #1
 USED ON 40104 KIT



16-9192-1
 TEMPLATE CONTROLS
 3-24 PLAYER #2
 USED ON 40104 KIT



3-26

16-9192-3
 TEMPLATE CONTROLS
 PLAYER #4
 USED ON 40104 KIT

NOTES:

WARNINGS & NOTICES

Warning

USE OF NON-WILLIAMS PARTS OR CIRCUIT MODIFICATIONS MAY CAUSE SERIOUS INJURY OR EQUIPMENT DAMAGE! USE ONLY WILLIAMS AUTHORIZED PARTS.

- * For safety and reliability, substitute parts and modifications are not recommended.
- * Substitute parts or modifications may void FCC type acceptance.
- * This game is protected by federal copyright, trademark and patent laws. Unauthorized modifications may be illegal under Federal law. This also applies to WILLIAMS logos, designs, publications and assemblies. Moreover, facsimiles of WILLIAMS equipment (or any feature thereof) may be illegal under federal law, regardless of whether or not such facsimiles are manufactured with WILLIAMS components.

Warning

This equipment generates, uses and can emit radio frequency energy and, if not installed properly and used according to the directions in this manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of part 15 of FCC rules which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference to radio communications, in which the user, at his or her own expense, will be required to take whatever measures may be needed to correct the interference.

Warning

Prevent shock hazard and assure proper game operation. Only plug this game into a properly grounded outlet. Do not use a cheater plug to defeat the power cord's grounding pin. Do not cut off the ground pin.

Notice

When Williams Electronics ships a game it is in compliance with FCC regulations. Your sticker is proof. If the sticker is missing or damaged, legal repercussions to the owner or distributor of the game may result. If your game kit does not contain an FCC sticker, call Williams Electronics immediately.

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